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LOGISTICS GUIDELINES FOR FAMILY PLANNING PROGRAMS

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LOGISTICS GUIDELINES
FOR
FAMILY PLANNING PROGRAMS

PROGRAM SERVICES SECTION
PROGRAM EVALUATION BRANCH
DIVISION OF REPRODUCTIVE HEALTH
CENTER FOR HEALTH PROMOTION AND EDUCATION
JUNE 1985

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
CENTERS FOR DISEASE CONTROL
ATLANTA, GEORGIA 30333

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FAMILY PLANNING LOGISTICS GUIDELINES

INTRODUCTION

In developing countries one of the problems that managers of family planning programs face is to assure continuing availability of supplies in family planning outlets. In many programs there are supply imbalances. These imbalances range from outlets frequently running out of contraceptives (stockouts) to other outlets either stocking items they cannot use (such as IUD's in outlets with no trained personnel for their insertion) and/or holding a surplus of several years worth of supplies. These situations result in clients being unable to continue in the program or some items becoming unusable because of age. At the same time, evidence from several well-functioning programs shows that continuous availability has a substantial positive effect on acceptance and continuation.

Personnel in the field who are responsible for procuring family planning supplies and ensuring that they reach their ultimate destination are therefore finding it increasingly important to acquire an understanding of the principles and practices of logistics. These guidelines are designed to fill this need by providing a better understanding of logistics, as well as the means to diagnose logistics problems as they arise. The manual, which is generally oriented toward managing contraceptives, will not discuss the management of nonexpendable equipment.

I. LOGISTICS DEFINED

A. Scope

In the broadest sense, all logistics systems start with the original raw materials and labor inputs required in the manufacturing process and extend to the locations where the commodities are dispensed to consumers. Therefore, the first activity is predicting what is needed and how much. In a country that is just beginning to develop a family planning program, supply needs are usually based on estimates of the population to be served. The program estimates its supply needs for the target population, identifies a source of supply, and then plans appropriate management, transportation, and warehousing systems. Family planning supplies may be donated to the program by bilateral or multilateral agencies, purchased from local or international suppliers or manufactured locally.

Most family planning programs will have little control over choosing the components of their logistics system. Sources of supply, warehouses, distribution points and logistics procedures frequently are already in place, particularly if family planning is integrated into other health-related activities. Therefore, program managers are not free in the short run to make radical changes in these facilities or procedures. In such cases, managers must seek to improve the efficiency of the existing systems rather than establish new systems.

B. Component Activities

Twelve different activities make up the logistics system in a family planning program. These are:

1. Selection of items to be used,
2. INVENTORY MANAGEMENT*,
3. Forecasting quantities to be procured or manufactured,
4. Procurement,
5. Receiving from suppliers,
6. Central level warehousing,
7. Repackaging,
8. Processing orders for lower levels,
9. Shipping to lower program levels,
10. Transportation,
11. Warehousing at lower program levels, and
12. Serving consumers.

Selection of supplies to be used by the program and forecasting quantities needed are not responsibilities assigned to those who manage the logistics system, but to the various program divisions. For example, the contraceptives to be dispensed may be chosen by a selection committee composed primarily of physicians and planners, perhaps including persons not directly employed by the program, such as a representative from the national drug control board or

* Capital letters are used for emphasis only.

consultants. Among other things they must take into account is that most donors have a limited list of supplies available that may determine what methods a program can offer to its users. The manager of the logistics system should be a member of the committee or at least be kept informed of the committee's decisions, since his or her responsibilities are to identify sources of supply, determine lead times, and to perform other supply management functions that might affect any item chosen for use in the program.

The second activity on the list, INVENTORY MANAGEMENT, is capitalized since this is the central activity upon which the others depend. Inventory management is the link between consumer demand and the program's manufacturing or procurement activity. If this activity is functioning properly, consumption draws down the inventory level and manufacturing or procurement builds it up in a continuing process, as illustrated in Figure 1.

The procurement activity requires a flow of supplies into the program, which in turn involves inbound shipping and receiving operations. The materials are usually stored in a central warehouse and then shipped to family planning outlets for ultimate distribution to consumers. Intermediate activities include transportation, warehousing in the field and, in the case of commercial retail sales (CRS) programs, repackaging.

All 12 activities depend upon and affect the others. If these activities are well managed, logistics system will function efficiently. Although a poorly managed logistics system will be a cause of low acceptance, particularly if stockouts occur, a well managed system only guarantees continuous availability of commodities. Additional program inputs, beyond the scope of the logistics system, are necessary to ensure a high level of consumer acceptance.

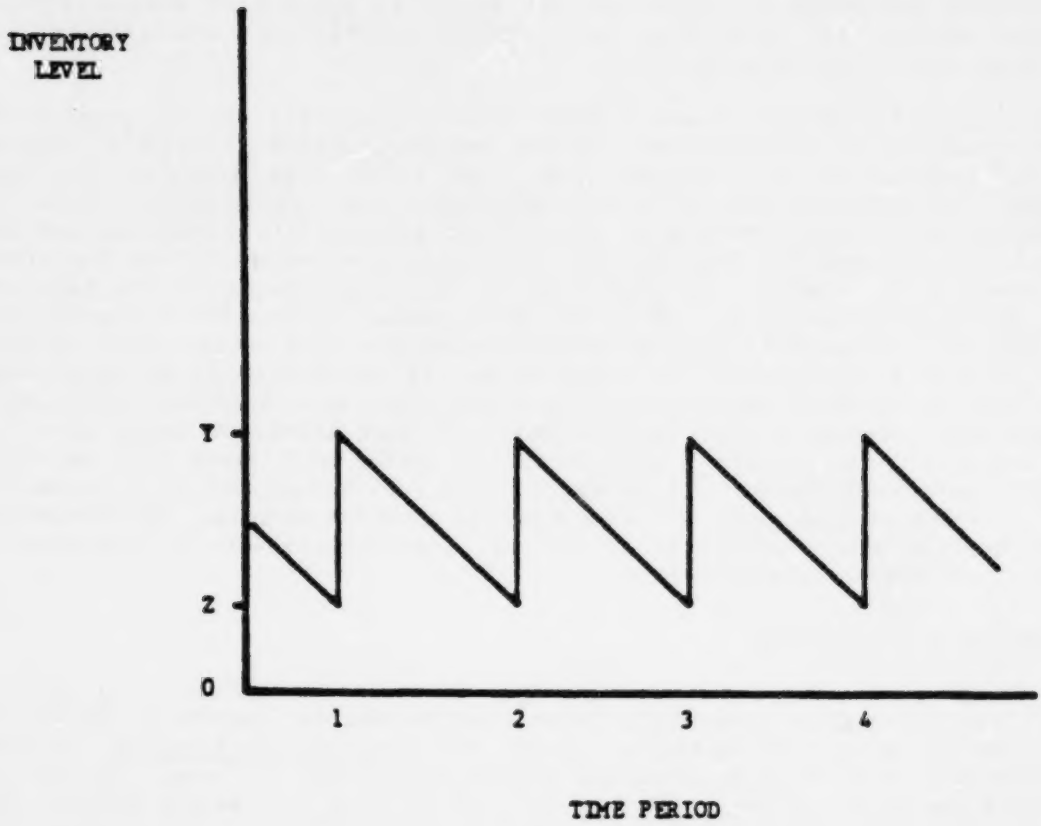
C. Objectives

Many organizations, including family planning programs, state their logistics objective as "the five rights," which are getting the right quantities of the right goods to the right places at the right time for the right cost. However, no logistics system can simultaneously maximize service to consumers and minimize distribution costs. Maximum service requires large inventories, premium transportation, and many warehouses--all of which raise distribution costs. Minimum distribution costs assume cheap transportation, low stock levels, and few warehouses.

The logistics objective can be better framed within the context of an efficient system, that is, the ratio of a system's output to its input.

A family planning program bears certain costs (inputs)--principally transportation, inventory, and warehousing--when providing a given level of service. A system is efficient if no reorganization of inputs could reduce the costs while maintaining an adequate level of service. However, if reorganization is needed, remember that logistics component activities are highly interrelated and that decisions must be made on the basis of what is best for the program as a whole. For example, if a program decides to reduce the frequency of shipments to its outlets from six to three a year to save on

Figure 1. Basic Inventory Movement



Consumption draws down the inventory level within each time period after which it is then built up by manufacturing or procurement.

transportation costs, the size of the orders and the quantity of inventory to be maintained must be doubled to provide the same level of service.

The basic output of a family planning logistics system is the level of service to the outlets. Level of service depends on the following components: availability of contraceptives, timely ordering or allocation of supplies, inventory maintenance, and reliable delivery. In a family planning program, the level of service to the outlets must be high. Because of the consequences of unwanted pregnancy, a program can ill afford to run out of contraceptives at any outlet and therefore must assure continuous availability of contraceptives at all program levels.

A family planning program needs a smooth flow of supplies and equipment with no overloads and no interruptions, so the logistics system for such a program can be compared to a pipeline, from the source (manufacturer) to the consumer. A logistics system, like a waterpipe, has its capacity. This is determined by storage capacity of central and intermediate warehouses and by transportation capability that is, the ability to move supplies from one point to another in the system. The resistance of the pipe determines the speed of flow under a given pressure. If more flow is needed, either the resistance of the pipe must be reduced, usually by increasing the size of the pipe, or the pressure must be increased. In other words, if the system is to move more goods than it is designed to carry, employees must work overtime, additional transportation capacity must be provided, and more warehouse space must be made available. Also, like a waterpipe, the system will stand only so much pressure before it breaks; there may be gradual leakage or as a dramatic burst. As the program grows and more supplies need to be moved, the logistics system must adjust. Failure to do so will inevitably result in breakdowns, "leaks," and disruptions of service.

D. Logistics Information

This brings us to three basic components of logistics information, or the three "basic logistics numbers." These must be defined before an effective logistics system can be designed. First, the rate of distribution, or the quantity of each item to be dispensed to consumers, must be known. Second is the quantity that can be maintained in storage and in transit within the system. The third component is the time required between the realization of need and the delivery of the goods, or lead time.

Thus, the success of the system depends to a great degree on how well the basic logistics numbers are understood and the quality of the data upon which they are based. The more items there are in the system, the more difficult it becomes to manage, because each item has its own rate of flow and its own storage needs.

II. LOGISTICS SYSTEM MANAGEMENT

This section presents general guidelines for the management of component activities of the logistics system. This section will help identify logistics problems in family planning programs and serve as a guide to timely and accurate corrective action to alleviate these problems. Because of the specialized nature of forecasting, and since accurate forecasting requires a prior knowledge of the other component activities, it will be dealt with later in a separate chapter. Three of the component activities will be dealt with only briefly. They are:

1. Shipping from suppliers - This activity is largely the responsibility of donor agencies, distributors, and manufacturers. Program staff should monitor transit times to ensure that particular shipping lines or routings used do not cause excessive delays in the arrival of supplies. Suppliers should be informed of excessive delays so they can take corrective action.

2. Receiving from suppliers - This activity consists of receiving goods at the port of entry and customs clearance. Prompt clearance and delivery of program commodities are essential to an efficient logistics system. However, the problems encountered in this activity are so specific to individual countries that the topic is beyond the scope of these guidelines. Program staff should monitor customs clearance time and, if excessive, consult with personnel dealing with customs brokers to minimize delays.

3. Repackaging supplies - Supplies are repackaged to have local brand names and a particular package size. Repackaging is a logistics activity that is usually specific to commercial retail sales programs.

No one set of guidelines can apply to all situations. For example, items of supply vary from one family planning program to another. Furthermore, programs differ in their organization as some programs offer only family planning services while others are integrated with other health services. Finally, logistics management is, to a great extent, related to geography and economic development, factors that obviously differ from country to country. Nevertheless, the guidelines presented in this section can be applied to most situations.

A. Inventory Management

Inventory management, the heart of any logistics system, is the maintenance and storage of optimal levels of inventory at all program levels to meet consumer demand for contraceptives. Without proper inventory control, there will be an under- or oversupply of contraceptives; either situation will result in losses to the program. Undersupply will reduce the program's capacity to serve its target population, and oversupply will result in waste.

Inventory management systems tend to fall into one of two categories: (1) the "push," or allocation system, in which supplies are allocated down the network to intermediate warehouses and eventually to the outlets, and (2) the "pull," or requisition system, in which demand at the outlets draws supplies from higher level storage facilities.

The essential difference between the systems lies in the location of decision making for the flow of supplies. In the push system, this decision is taken at the higher level; in the pull system, at the lower. Thus, in a push system the outlets are not responsible for ordering their own supplies; in a pull system they have this responsibility, as illustrated in Figure 2.

There are advantages and disadvantages associated with each system. Some advantages of a push system are that it (1) requires minimum training of personnel at the field level, (2) eliminates unrealistic orders from outlets, and (3) maintains adequate stock in the outlets according to program policy. Some of the disadvantages include (1) the essential need for timely reporting of stock levels and consumption, (2) the need for timely data processing on several items of supply for outlets and other program levels, and (3) lack of involvement of field staff in the logistics system, and the resulting loss of sensitivity to special or unusual field conditions.

In most cases, the advantages and disadvantages of a pull system are the opposite of those for the push system. One advantage is that once a pull system is operating well, the need for reporting stock balances, items dispensed, etc., can be minimized. In fact, commodities previously dispensed can then be reported in requisitions. However, when a pull system is first implemented, it requires close supervision at field levels, especially when field personnel lack knowledge and experience in logistics management.

A push system is indicated for a program where conditions are uncertain and field personnel have had little or no experience in supply management. As key supply personnel become more experienced and better trained, it may be possible to implement a "mixed" system. An example of a "mixed" system is a pull system from the central warehouse to the intermediate warehouses, and a push system from the intermediate warehouses to outlets. Another type of mixed system is where certain items are allocated and others are subject to requisition.

To summarize, there are three primary factors to consider when deciding whether to use a push or pull system or a combination of these:

1. the management skills of the individuals working at each level in the system,

2. the information available about actual usage at each level, and

3. the number and quantity of different items (called line items) managed.

A push system is more appropriate if:

1. information about actual consumer usage at outlet levels is available and reliable,

2. information processing capacity is available at the central and intermediate levels,

3. demand for supplies is greater than level of the supplies available and supplies thus must be rationed among facilities at lower levels,

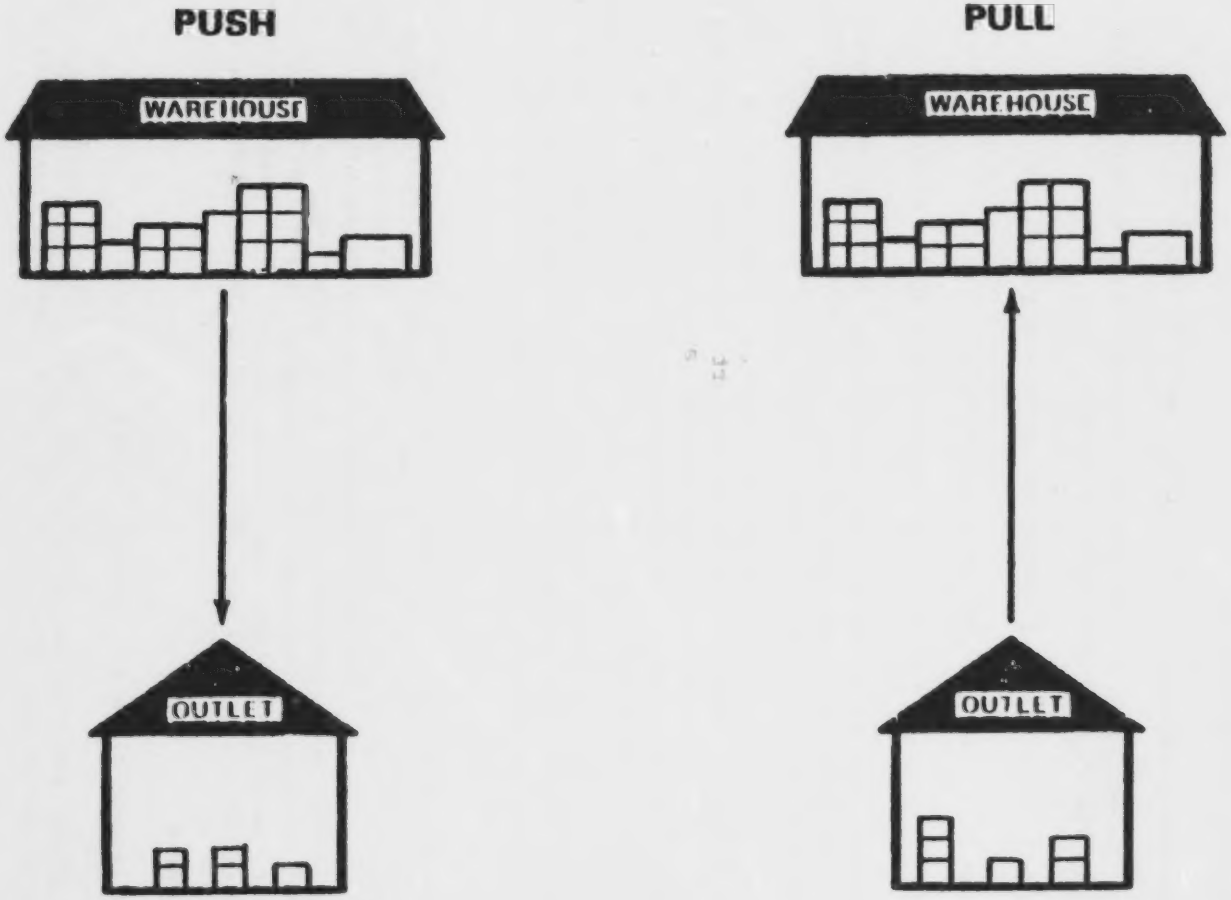


Figure 2. Types of Inventory Control Systems

4. staff at lower levels in the system do not possess the management skills necessary to make logistics decisions,

5. the responsibility for program operations is centralized, and

6. relatively few items are managed.

A pull system is more appropriate if:

1. data-processing capacity at the central level is limited,

2. staff at lower levels in the system have sufficient management skills to enable them to make logistics decisions,

3. responsibility for program operations is decentralized,

4. many line items are included in the system, and

5. supervision at field levels is an integral part of the program.

In general, programs tend to start as push systems and convert to pull systems when skills are improved, when the program has established accepted routines, and when shortages of various items of supply are minimized.

Guatemala, for example, has a successful push system. The logistics program is staffed by a director, four promoters and support personnel. Each promoter is responsible for visiting and resupplying approximately 140 health facilities every 6 to 8 weeks. The amount of contraceptive supplies to be issued to the facilities is determined by the promoters from their review of logistics data maintained by the facilities and from taking physical inventories. Since the logistics system has been in operation, very few health facilities have reported shortages of contraceptive supplies. One result of the program is that the quantity of contraceptives dispensed doubled in 2 years.

On the other hand, the supply system of the Social Security Institute in Panama is a pull system. Unlike the Guatemalan system, health facilities in Panama determine the timing and quantity of the flow of supplies. At least one person in each health facility is trained in supply management, and this person is responsible for requesting supplies when quantities reach a minimum level. Another difference is that in Guatemala only family planning commodities are managed, whereas the needs of the total health system, including hundreds of different items, are provided in the Panama system.

B. Types of Orders

In most supply systems there are two basic types of orders:

1. Stock orders are routine, prescheduled orders. They are designed for relatively large quantities to be shipped by low-cost transportation.

2. Fill-in orders are placed when stocks are depleted in order to avoid having supplies run out. A fill-in order may require an expensive means of communication, such as a telegram or a long-distance call; and an expensive means of transportation, such as air freight. Some programs deal with this situation by borrowing supplies from a nearby unit. However, the "lender" and the "borrower" should be resupplied as soon as possible. Lending between outlets should not be encouraged and can be minimized in an efficient system.

The demand for contraception in most family planning programs usually can be predicted accurately enough to minimize the need for emergency orders. Often, these situations arise because a special campaign is scheduled without considering the availability of supplies to support it or the increased demand that follows. Less frequently, emergency situations are caused by natural disasters, such as fires or floods, where all the supplies are destroyed. The family planning program should establish procedures for such cases.

C. Stock Levels

Stock levels are usually based on the maintenance of inventory at all program levels sufficient to ensure the continuous availability of contraceptives in case of delays in delivery or unexpected high demand. This is expressed in terms of a quantity of supplies sufficient to meet a certain number of months of anticipated demand. For example, program policy may be to maintain 3 month's supply in all outlets. This policy can result in confusion because the supply officer may not be sure whether he or she should have more or less than this quantity on hand. This situation can be clarified by using a range to express the quantity of supplies to be kept on hand, such as not less than 2 months' supply and not more than 4 months' supply. This is called a maximum/minimum system and its basic elements are:

1. minimum month's supply--the lead time under the worst possible conditions, plus safety stock.

2. minimum quantity--actual quantity of articles represented by minimum months' supply; the point below which the inventory level should not fall under normal conditions.

3. maximum month's supply--the number of months' supply above which inventory levels should not rise under normal conditions. Routine stock orders should bring inventory levels up to this point.

4. maximum quantity--actual quantity of articles represented by maximum months' supply.

5. operating stock--the difference between maximum and minimum quantity.

6. resupply interval--the amount of time a distribution point needs to be resupplied to maintain its inventory level between maximum quantity and minimum quantity. The resupply interval is the number of months represented by the difference between maximum months' supply and minimum months' supply.

For example, if a distribution point's maximum months' supply is 6 months and minimum months' supply is 2 months and the projected distribution period for an item is 50 per month, then maximum quantity is 6 x 50 = 300, and minimum quantity is 2 x 50 = 100. The frequency of resupply, is 6 - 2 = 4 months. There will be 1 shipment every 4 months, or 3 shipments per year. The operating stock in this example is 200. Thus, the choice of maximum months' supply and minimum months' supply determines how frequently an order is placed and the average amount of stock on hand.

If the resupply interval is already established, then the choice of maximum months' supply and minimum months' supply should be based on this frequency. This is usually the case; in most instances, the frequency of resupply is a "given," and it is usually determined by such variables as the availability of transport and the relative accessibility of different geographical areas. Thus, maximum and minimum quantities may vary among different program areas.

The quantities that correspond to maximum months' supply and minimum months' supply are estimated by computing the quantities to be dispensed over time—usually the most recent 6 months in an ongoing program--and adding a factor for program growth. If, in this example, the outlet distributed 270 articles during the past 6 months and distribution is growing at the rate of 10 percent per year, the estimated amount to be dispensed per month is $(270 \div 6) + 0.1 \times (270 \div 6) = 50$ articles. This also represents a month's supply.

In a new program where there are no historical data available, these quantities should be based on the program plan for each location. Program planners sometimes express targets as a percentage of married women of reproductive age (sometimes abbreviated as MWRA), or as a percentage of all women of reproductive age. In addition, a percentage estimate of the contraceptive method mix that will occur, is applied to the target. The manager of the logistics component must then determine the quantities of the various contraceptives to be made available. (See the section on forecasting for a more detailed discussion of how these estimates are made.)

Many factors affect the choice of the maximum and minimum months' supply to be maintained in warehouses or outlets. Some of these factors are the reliability of the source of supply; the cost of supplies, shipping, emergency orders and storage; quantities on hand at the central level; shelf life; storage capacity at the outlet level facilities; lead time; accuracy of forecasting; and the number of different items in the system.

Care must be taken to ensure that the difference in concept between quantities of any item of supply that are issued from the central warehouse to field warehouses and quantities that are dispensed to ultimate users is clearly understood at all program levels. One way to do this is to use different terms for these transactions. For example, some programs use the word "dispensed" for those items given or sold to consumers and "issued" for items given to another program level.

D. Delivery Schedules

In determining the type of system to be used and quantities to be maintained, planners must determine a delivery schedule for stock orders. The delivery schedule (as well as many other component activities of logistics) is largely based on three factors as they apply to each program location. These factors are:

1. the amount to be dispensed to consumers (demand),
2. the amount to be maintained on hand, and
3. the lead time.

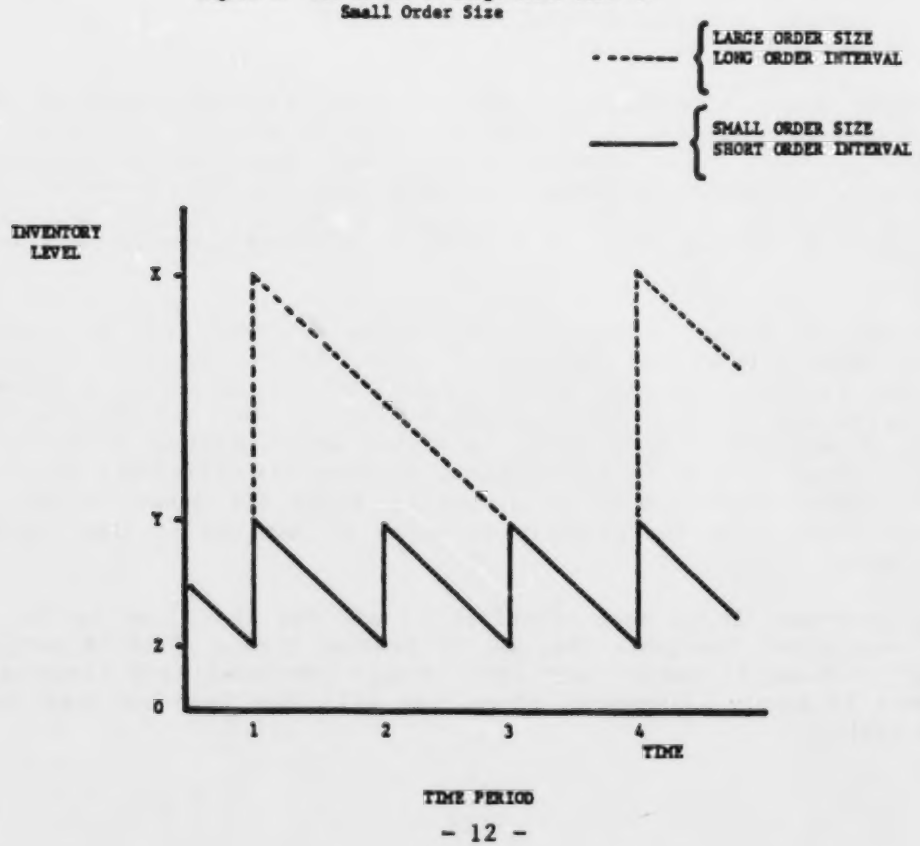
Based on these data, the delivery schedule is determined by:

1. the order size; that is, how many contraceptives should be ordered, and
2. the order interval; that is, how often they should be ordered.

Obviously, the order size and the interval are interrelated. The order size determines how often it will be necessary to deliver supplies and the order interval determines the size of the order.

Figure 3 illustrates this relationship.

Figure 3. The Effect of Large Order Size Vs. Small Order Size



Point X represents maximum quantity for a large order size/long order interval situation; Z is the minimum quantity at this location. The amount XZ is the location's operating stock and the amount OZ is the safety stock. If inventory falls below Z, the location will be using its safety stock. A similar descriptive analysis could be made for the small order size/short order interval situation, except that Y would be the maximum level of inventory, and YZ would be the operating stock. The necessity for safety stock will be explained in more detail later in this section.

As can be seen in Figure 3, the frequency of shipments can be reduced by increasing the order size. However, reducing the frequency of orders requires increasing stock levels. The order interval is illustrated as the time between 1 and 2 for the small order size/short order interval and the time between 1 and 4 for the large order size/long order interval. For example, certain family planning outlets in difficult-to-reach areas might be resupplied only once a year. This would require keeping more than a year's supply of contraceptives on hand, since the distribution point should have safety stocks on hand when the yearly supply of contraceptives arrives. If the storage space at the outlet is inadequate (too small, damp, subject to theft, or unprotected from pests), this procedure would not be acceptable. On the other hand, if the storage space at the outlet is satisfactory, costs of storage at the central level and transport costs to the field could be reduced.

The types of delivery schedules can be categorized as follows:

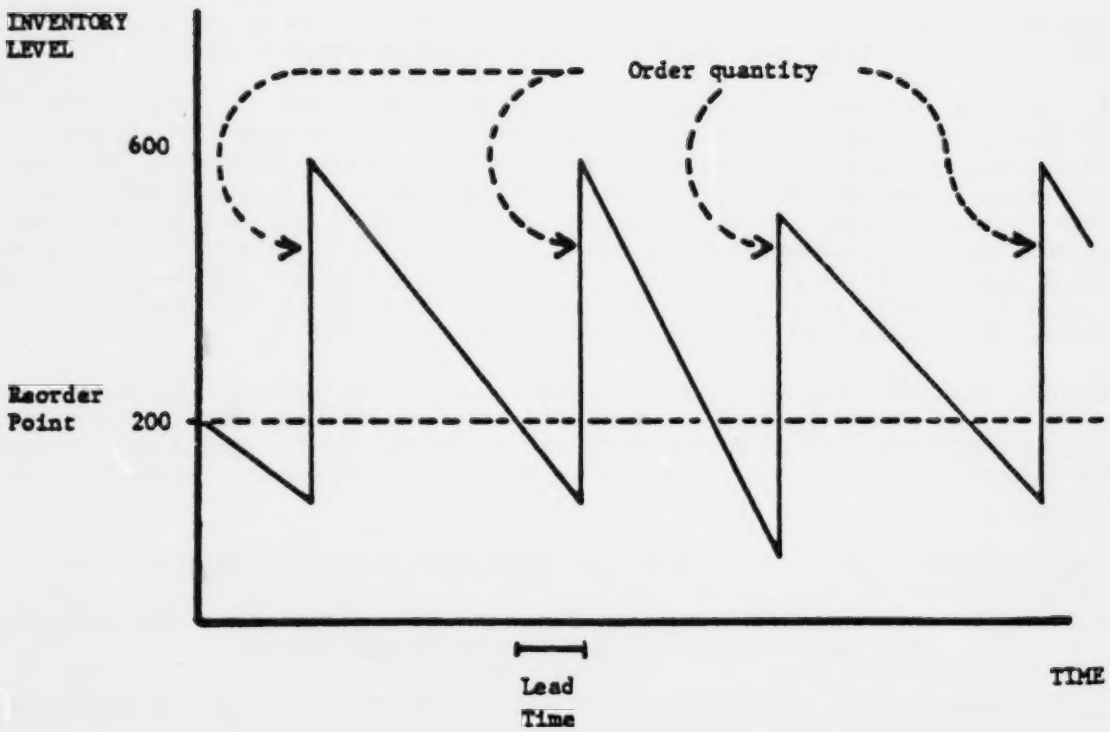
1. a fixed order size/variable order interval,
2. a variable order size/fixed order interval, or
3. a combination of the above.

In a fixed order size/variable order interval delivery schedule, a fixed quantity of contraceptives is ordered or allocated whenever the inventory at a particular location falls below a certain level, known as the reorder point. For example, it might be determined that whenever the inventory of oral contraceptives drops to 200 cycles at a certain outlet, 400 cycles more should be ordered from the supplier. This type of delivery schedule is illustrated in Figure 4.

The appropriate reorder point for a given item may vary from one location to another. When determining the reorder point, it is important to allow for lead time; that is, the time needed to deliver the requested supplies. (In other words, the reorder point should be set in such a way that the new shipment of supplies is very likely to arrive before minimum stock levels are reached.) Since program locations normally stock and distribute more than one item, a single order should be placed to bring all items to the maximum inventory levels when the quantity in stock of any one of them reaches the reorder point.

In most programs, it is more practical to add the lead time to the minimum months' supply and designate this as the reorder point. This is particularly true for programs in which lower level supply personnel lack training and/or experience in supply management, since they will then have one less factor to contend with.

Figure 4. Fixed Order Quantity -
Variable Order Interval System



In the more common (and more practical) delivery schedule--that characterized by variable order size/fixed order interval--shipping is fixed for a specific time, for instance, every 3 months. The size of the order varies according to the stock remaining at the time an order is made. The idea is to bring the stock level of all items up to maximum quantity inventory at fixed intervals. One advantage of this system is that it allows the motor pool dispatcher to stagger deliveries and plan them well in advance. Another advantage is that periods for requisitions and/or allocations to different locations in a given area are also fixed in time. The system is, therefore, a fixed one, and is much easier to operate and supervise. Maximum and minimum months' supply stock levels, requisition dates and shipping dates are determined by the central office (or shipping office in a multi-level program); the primary concerns of the receiving locations are the maximum quantity and requisition dates. That is, staff at the local level know that a requisition must be placed on a certain date in an amount sufficient to bring stock level up to a certain quantity. The only other consideration is that maximum and minimum quantities should be recalculated before placing each stock order to insure that the stock levels being maintained correspond to program policy.

Supply personnel must understand that fill-in orders must be placed whenever minimum quantity will be reached for any item before the scheduled shipment is to arrive. If this happens very often, then the maximum quantities for those particular items should be increased. In any case, the central office in a push system, or the person in charge of the local supply system in a pull system, should continuously review quantities on hand as related to quantities being used or dispensed. Maximum and minimum quantities must be revised as necessary to keep inventory in balance at all levels, at all times, for all items. A graph of this kind of system is shown in Figure 5.

As with push-pull systems, mixed delivery systems also exist. An example is where routine items are scheduled at fixed intervals, and special items such as drugs with short shelf lives (or those requiring special handling) or items for special activities or campaigns are handled on a variable order interval system.

Several factors influence the decision about which delivery schedule to use:

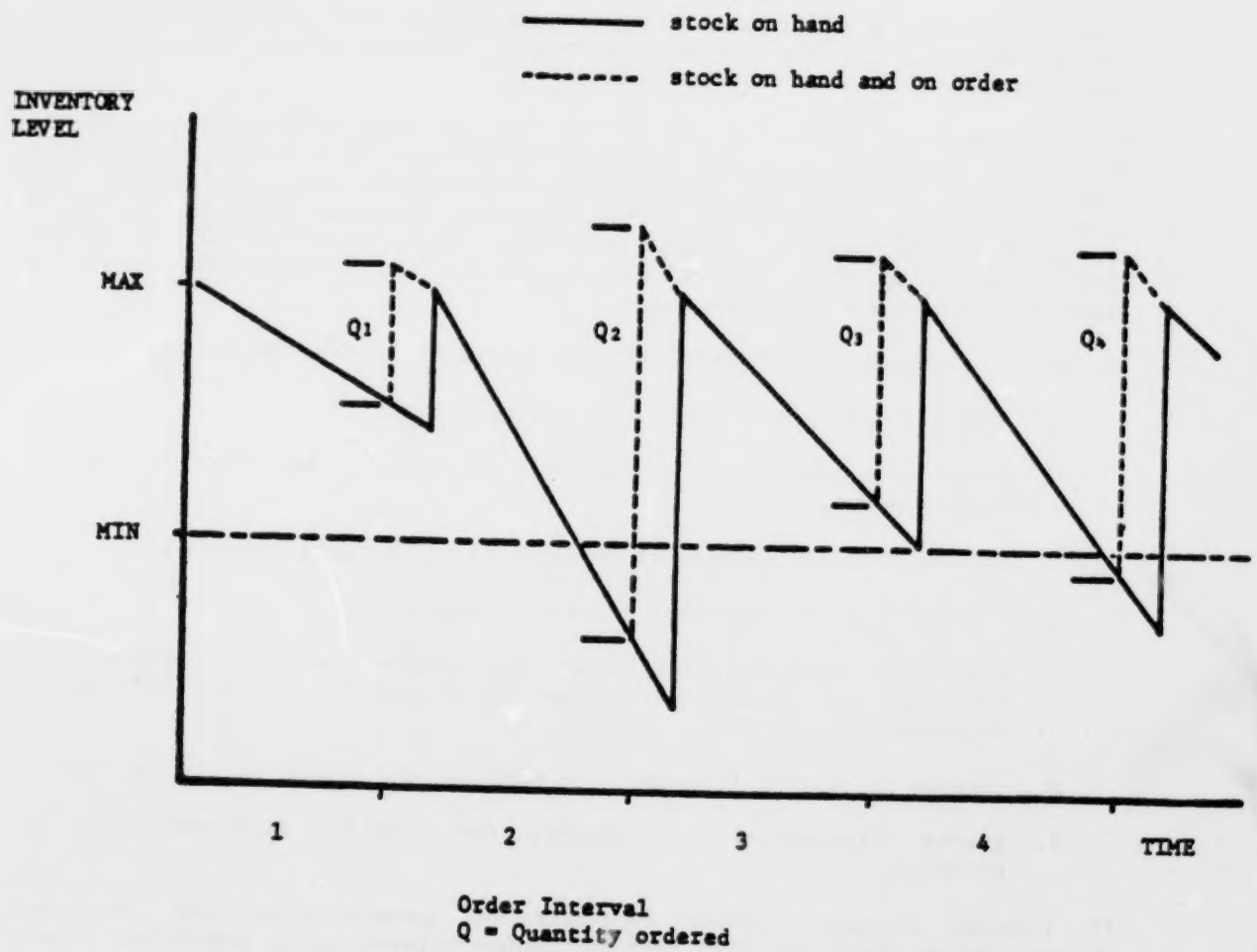
1. the cost and difficulty of transporting supplies from one point to another (cost of gasoline, condition of roads, weather),

2. whether the program has its own transport or relies on commercial transport, and

3. whether several different items of supplies and/or equipment will be shipped together.

The variable order size/fixed order interval delivery schedule is, in most cases, appropriate because transportation costs are usually high, the availability of vehicles is almost always limited, other supplies are usually shipped with contraceptives, and this type of system is less complicated and easier to supervise. For these reasons the variable order size/fixed order interval delivery is most often recommended for family planning programs.

Figure 5. Fixed Order Interval -
Variable Order Quantity System



Order Interval
Q = Quantity ordered

E. Safety Stock

Safety stock provides a reserve for unanticipated increases in demand or breakdowns in the supply system. Figure 6 illustrates the need for safety stock, in this case in a variable order size/fixed order interval delivery schedule. As the figure illustrates, part of the safety stock is used when deliveries to the facility are late, as in periods 2, 4, and 6. Additional reasons for using safety stock are late submission of the monthly report in a push system or late submission of the requisition in a pull system. Fill-in orders might be indicated in situations such as period 6 where demand is higher than expected. In general, fill-in orders are more costly than routine orders. Part of the logistics objective is to avoid these non-routine orders because they increase program costs.

F. Transport Alternatives

A family planning program has two major alternatives when planning an internal (within-country) transportation system: program-owned and operated transportation, or commercial transportation.

Many programs use a combination of the two: program transportation at the central and regional levels and public transportation at lower levels. Public transportation is used by personnel from outlets receiving supplies when they travel to an intermediate level office to obtain their salaries at the end of the month. This type of system frequently causes problems and should be discouraged, since field personnel encounter difficulty being reimbursed for expenses incurred carrying supplies.

The major advantages of program-owned and -operated transportation are:

1. greater control over scheduling and delivery,

2. lower operating costs, particularly if vehicles are used for general program purposes, and

3. reduced need for commercial transportation in rural locations.

The major advantages of commercial transportation are:

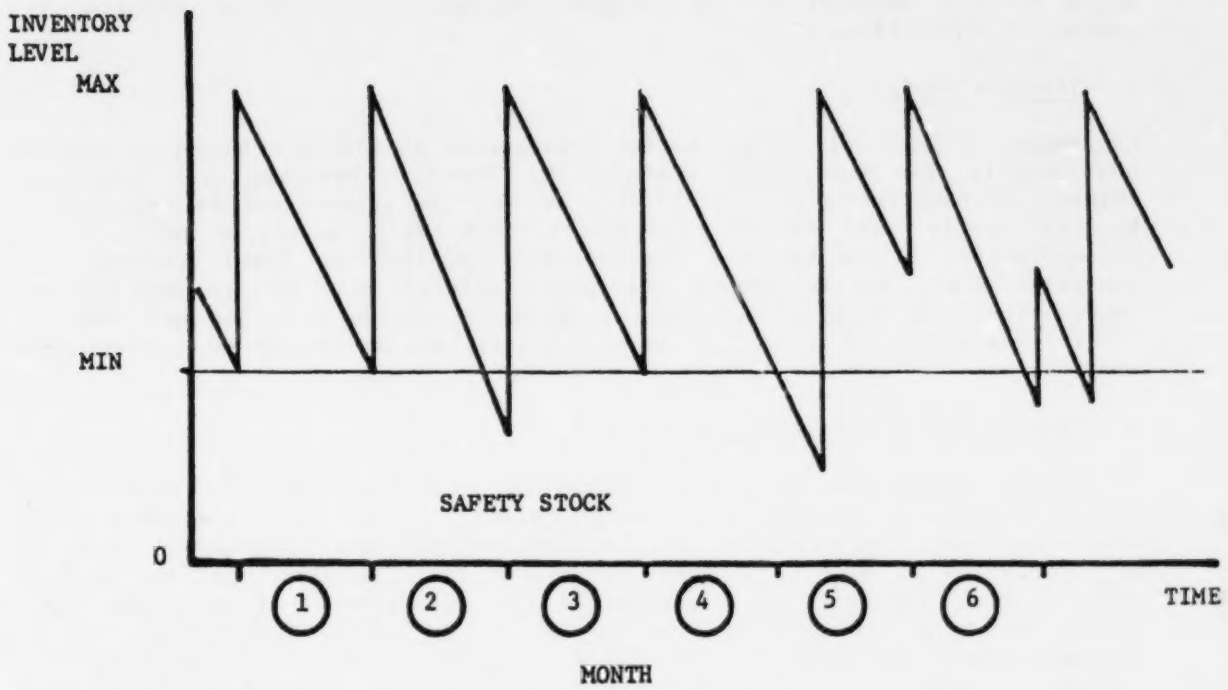
1. simplified administration, since the program is not responsible for operating and repairing vehicles or hiring drivers and maintenance personnel,

2. savings in capital investment in vehicles and repair facilities, and

3. greater flexibility and capacity for handling different sizes of shipment.

If program managers choose to rely on program-owned and -operated transportation, they may also have to decide between using commercial repair and maintenance facilities or program-operated facilities. The principal advantage of commercial repair facilities is greater control over the quality

Figure 6. The Need For Safety Stock



Fixed order interval - variable order size system
Supplies are delivered at the beginning of every month

Month
1. Demand is as expected; delivery is on time.
2. Demand is higher than expected. The outlet dips into its safety stock.
3. Demand is as expected; delivery is on time.
4. Demand is as expected; delivery is late.
5. Demand is as expected; delivery is on time.
6. Demand is higher than expected; an emergency order is submitted and received on time; delivery is late.

of work performed since, if program managers are dissatisfied, a switch can be made to a different repair facility. Sometimes program-operated repair facilities are relatively low cost. Many programs use a combination of both types--routine maintenance by program mechanics and major repairs by commercial facilities.

G. Transport Budget

Management of internal transportation presupposes an adequate budget to assure that supplies are distributed efficiently. However, problems with financing internal transportation will frequently arise. The transportation budget must be sufficiently large and higher administrative levels should be assigned the responsibility of paying for transporting supplies to lower levels. In countries where administration has been regionalized, and transport from central-level or intermediate-level storage facilities must be paid for by lower-level units, shipping can be very inefficient and cumbersome, since few programs provide adequate funds to low-level facilities.

H. Type of Commercial Transport

If program managers decide to use commercial transportation, the appropriate type of transportation must be chosen in relation to the type of shipment. In most countries, air freight is the fastest and most expensive form of transportation by weight, followed by motor freight, then rail and water. However, small shipments can sometimes be sent more cheaply by using otherwise costly forms of transportation because of lower costs of handling, faster delivery times, and other factors. This principle is especially applicable to contraceptive supplies, since they are light in weight relative to their bulk, and they are usually in lightweight cardboard cartons.

An additional factor is the difference in delivery time. If delivery times are long and/or irregular, the program will have to assume the cost of maintaining higher inventory levels or risk possible stockouts.

I. Information and Records Systems

Every inventory control system must be supported by an information and records system to monitor the flow of goods. In addition, the data collected in this system can be used for family planning program evaluation.

There are three ways supplies can leave a family planning facility: through the distribution system, by theft, or by damage and deterioration. The corresponding flow of information, which would be generated by any one of these actions, is known as a stock transaction record. Additionally, there must be records of the number of items on hand in each facility. These are known as stock-keeping records.

1. Stock Transaction Records

The details of inventory control of family planning commodities vary from country to country, particularly depending on whether requisitioning is by the push or pull system. Nevertheless, for

family planning programs in most developing countries, a single form, known as a Requisition and Issue Voucher (RIV), can be used for stock transactions at all distribution levels, regardless of the type of inventory control system. The RIV combines in one form a requisition, an issue voucher, and a receipt.

Figure 7 is an example of an RIV. It is a simple form that lists each item, quantity on hand, amount requested, quantity issued, quantity shipped, and quantity received. If the program sells its contraceptives, unit and total costs are also stated.

The requisition section of the RIV is filled out by the allocation officer at the shipping facility in a push system or by the requesting officer at the receiving facility in a pull system. In this example, the RIV is completed in four copies so the requester, approving officials, shipper, and recipient can enter appropriate information and eventually have copies confirming (or denying) that requested action was taken. The "Quantity on Hand" (Column 2) enables management to confirm that the program policy for maximum and minimum stock levels and reorder points is being followed. RIV's should be filed by number at all levels.

While this type of RIV is suitable for use at all program levels, simple prescription forms or issue vouchers may be more desirable at the outlet level . The vouchers should be in book form with two copies, the original to be given to the recipient of the supplies and the duplicate to remain in the book. An issue voucher includes the date, the recipient of goods, quantity and description of article issued, and the signatures of persons issuing and receiving the articles.

2. Stock-Keeping Records

The basic stock-keeping record is the Inventory Control Card (ICC), which should be kept at every storage facility for each item in inventory. There should be an ICC for each brand and formulation of pill and each size and, in some countires, each color of condom. An ICC shows quantities received and issued as well as the balance on hand. The purpose of the ICC is to have an up-to-date and continuous record of all supply transactions recorded in one place so that management can quickly determine trends in inventory and distribution.

In Figure 8 is an example of an ICC. The column "Requisition and Issue Voucher Number" refers to stock transaction records that record each individual supply transaction entered on the ICC. This entry need not refer to a RIV as such. For example, if the ICC is used at the central level to record receipts, this column would refer to a vendor's invoice or a similar stock transaction record. The key point is that the information in this column is the documentation that ties the stock keeping record on the ICC with the stock transaction record on file, whether the latter was recorded on an RIV or another type of stock transaction record. Since the vouchers are filed by number, the records for any transaction are easily retrieved.

Figure 7. Requisition and Issue Voucher

Requisition and Issue Voucher No. _____

Date _____ Ship to: _____

_____

_____

Ser No.	Requisition			Issue		Price		Remarks
	Article	Quan. on Hand	Quan. Requested	Shipped	Received	Unit	Total	
	(1)	(2)	(3)	(4)	(5)	(6)		( )
1.								
2.								
3.								
4.								

Requested by: _____ Date: _____

Approved by: _____ Date: _____

Approved by: _____ Date: _____

Shipped by: _____ Date: _____

Received by: _____ Date: _____

(make 4 copies)

Figure 8. Inventory Control Card

Article _____ Maximum Stock Balance _____

Warehouse Location _____ Minimum Stock Balance _____

Stock Number _____ Unit of Measure _____

Date	Requisition and Issue Voucher No.	Quantity			Balance on Hand	Remarks
		Requested	Received	Issued		

Depending on program needs, the ICC can contain the following additional information, as shown by the example in Figure 9 from Bangladesh:

a. the manufacture or expiration date (Column 5), which is important for the FIFO (First-In, First-Out) system of inventory control as will be explained in data in the Warehouse/Management section.

b. quantity destroyed and balance on hand, usable--not usable (Cols. 10, 11, 12), which are important data for monitoring date-expired and damaged commodities for removal from inventory. It also enables management to analyze losses and take corrective action.

Inventory Control Cards should be kept in a single file in the facility where the commodities are stored.

Many programs are beginning to use computers in logistics management. In such cases, the names of stock items must be translated into stock numbers and program locations into location numbers. Even without the use of computers, these numbering systems help reduce the amount of writing required and serve as a check to insure that the right item is shipped to the right location.

Stock numbers are usually a combination of numbers--the minimum being a 2-number system with the first number (usually 2 digits) designating the group and the second number designating the specific item.

Location numbers follow similar patterns with groups of numbers representing region, province, district, subdistrict, location, etc. A stock numbering system, if adopted, will require an extra column on most of the forms for the number.

The use of computers in logistics management is discussed in more detail later.

J. Physical Inventories

On a periodic basis, programs should conduct a physical inventory; that is, count all items to verify that the balances on hand are the same as the quantities entered in the stock-keeping records. Supplies should be inventoried at least annually and at all program levels. More frequent inventories should be conducted if there are frequent discrepancies between the actual balance on hand and the balance listed on the stock record.

When commodities are received and issued, they should be to verify amounts entered on stock transaction records. The ICC should then include the date of each physical inventory and quantity found, as well as comments and actions taken on discrepancies.

When performing physical inventories, goods in transit must also be accounted for. Standard procedure is to consider ownership or title of the goods to pass to the destination upon shipment; i.e., family planning supplies en route, but not received, at the time a physical inventory is performed, should

Form 6

GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH
POPULATION CONTROL AND FAMILY PLANNING PROGRAMME
INVENTORY CONTROL CARD

ICC No. 600000
Page No. _____

Article _____

Accounting Unit _____ Package Quantity _____

District _____ Thana _____ Sector _____

Date	RECEIPTS:					ISSUES:			Quantity Destroyed	Balance on Hand		Remarks
	Voucher Number	Quantity Requested	Quantity Received	Mfg-Exp. Date	Received from	Voucher Number	Issued to	Quantity Issued		Usable	Not Usable	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)

Figure 9. Inventory Control Card Used in Bangladesh

be counted as part of the inventory of the unit to whom the supplies were shipped. These should be counted as "stock in transit" by personnel performing a national inventory. In small programs, these quantities may be insignificant, but in large programs the quantities could be considerable, particularly if there are long shipping times. It is not unusual for programs to suspend routine shipping activities during planned physical inventory periods.

K. Reporting

Inventory reports are prepared periodically by summarizing the information appearing on the ICC's. In the report, lower administrative levels summarize quantities on hand and the movement of each item through their warehouse facilities for the report period, usually a month or a quarter. In some large programs, the inventory report also summarizes the movement of commodities through all lower-level facilities in the program for the report period. This information is used to monitor usage rates, determine inventory levels to be maintained, and provide information for estimating future needs. Data on quantities dispensed can also be used to calculate a figure on "couple-years of protection" (CYP*) and to estimate the number of clients in a program.

At the central level, periodic reports should be prepared on the status of supplies received from all sources and levels of the program. Examples of such reports include (a) a comparison of balances on hand for each item of supply at the central and regional warehouses, as well as outlets, in terms of actual quantities on hand and number of months' supply on hand, and (b) a trend analysis of quantities dispensed to consumers by contraceptive method and brand and by region or other appropriate subdivision. Examples of this type of analysis, as done in Bangladesh, are found in Figures 10-13.

A minimal inventory report for a small program should contain the information shown in Figure 14, a form used in Haiti. This type of form can be used at all levels: central, regional, and outlet.

Figure 15 is an example of a monthly report used in Bangladesh that contains information on commodities that are no longer usable. The report is meant to encourage management to dispose of such items, rather than to store them. The report provides data for analysis of these losses so corrective action can be taken. This form also contains information on the quantities dispensed to consumers and inventories kept at the lowest field level. Such information is then collated at district and central levels to monitor nation-wide usage rates and months' supply of commodities on hand in the field. This concept will be set forth in detail elsewhere in this manual.

An inventory management system for a national family planning program must deal with commodities supplied by many donor agencies and/or obtained through local purchase. Although at the central level it is desirable to keep separate inventory records for identical commodities coming from different sources, at field levels it is sometimes cumbersome, if not impossible.

*CYP is explained in detail in Chapter IV, Supply Data Analysis.

Figure 10. Quantities of Orals and Condoms on Hand at All Program Levels - January August 1979, End of Month - Thousands -

CONDOMS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
Central/Regional	49,260	52,857	49,419	52,965	56,769	62,358	63,918	55,721
Districts	12,716	14,090	18,655	16,890	15,510	13,102	14,287	16,463(2
Thanas	6,067	6,401	7,898	10,423	9,004	9,760	9,580	9,563
Field Levels	6,656	6,101	6,344	7,562	7,117	7,727	8,062	7,934
TOTAL	74,699	79,449	82,316	87,840	88,400	92,947	95,847	89,681
Quantity Distributed(1)	3,347	3,210	3,214	3,199	3,288	2,819	2,876	2,965
ORALS								
Central/Regional	7,419	8,524	9,233	10,289	11,803	12,397	14,081	15,434
Districts	3,640	4,186	4,213	4,704	4,499	4,411	4,354	4,184(2
Thanas	2,407	2,438	2,525	2,991	2,949	3,124	3,029	2,987
Field Levels	2,084	1,963	1,900	2,025	2,191	2,189	2,269	2,240
TOTAL	15,550	17,111	17,871	20,009	21,442	22,121	23,733	24,845
Quantity Distributed(1)	522	484	492	484	466	464	499	527

1) Average of the most recent six months distribution to users based on MIS reports.

Figure 11. Number of Month's Supply of Orals and Condoms on Hand At All Program Levels - January - August, 1979*

CONDOMS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
Central/Regional	14.7	16.5	15.4	16.6	17.3	22.1	22.2	18.8
Districts	3.8	4.4	5.8	5.3	4.7	4.6	5.0	5.6
Thanas	1.8	2.0	2.5	3.3	2.7	3.5	3.3	3.2
Field Levels	2.0	1.9	2.0	2.4	2.2	2.7	2.8	2.7
TOTAL	22.3	24.8	25.6	27.5	26.9	33.0	33.3	30.2
ORALS								
Central/Regional	14.2	17.6	18.8	21.3	25.3	26.7	28.2	29.3
Districts	7.0	8.6	8.6	9.7	9.7	9.5	8.7	7.9
Thanas	4.6	5.0	5.1	6.2	6.3	6.7	6.1	5.7
Field Levels	4.0	4.1	3.9	4.2	4.7	4.7	4.5	4.3
TOTAL	29.8	35.4	36.3	41.3	46.0	47.7	47.6	47.1

*Based on the data in Figure 15; quantities on hand divided by average monthly distributions to users.

Figure 12. Number of Month's Supply of Orals on Hand at all Program Levels January-August 1979

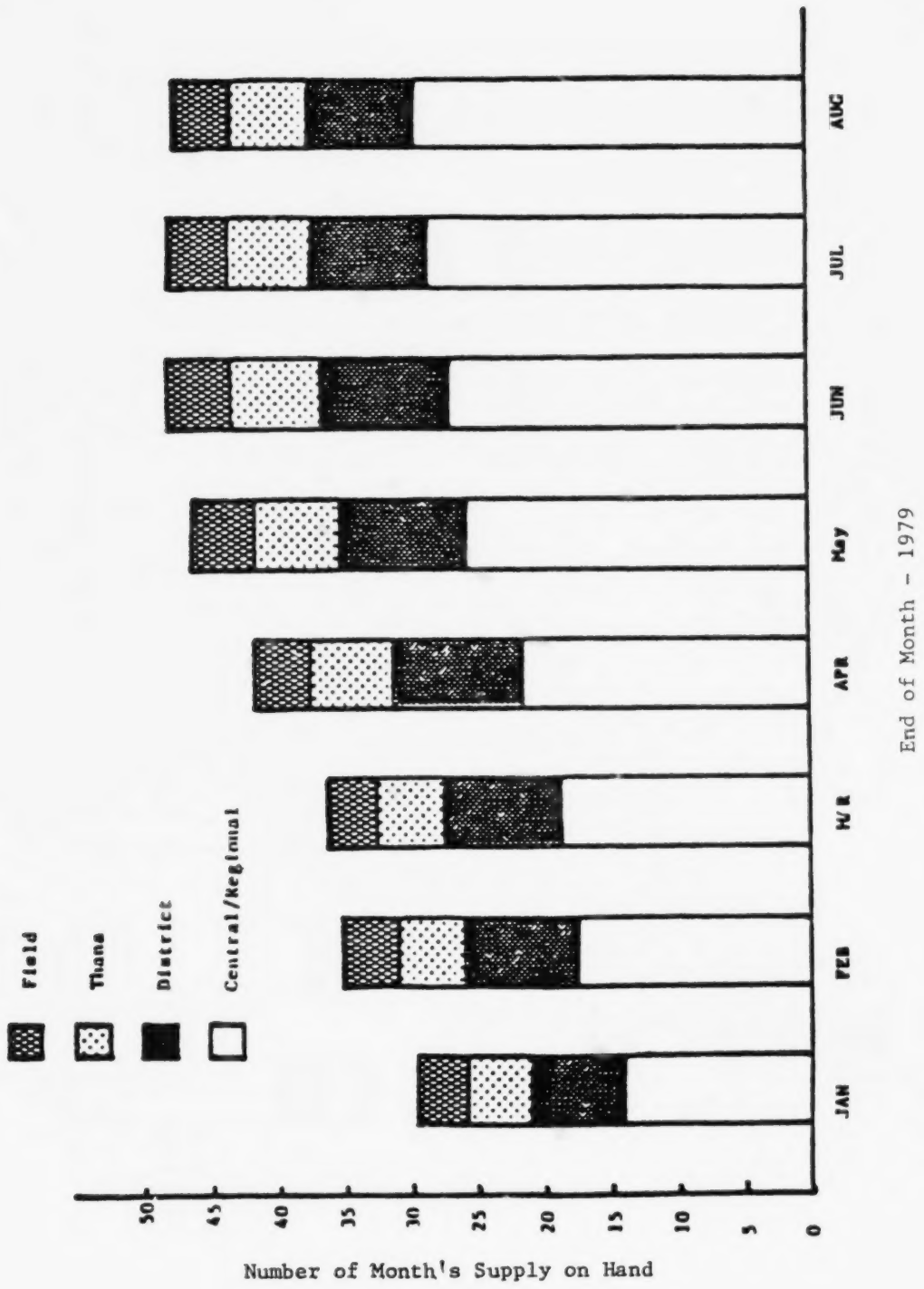


Figure 13. Number of Month's Supply of Condoms on Hand at All Program Levels January-August 1979

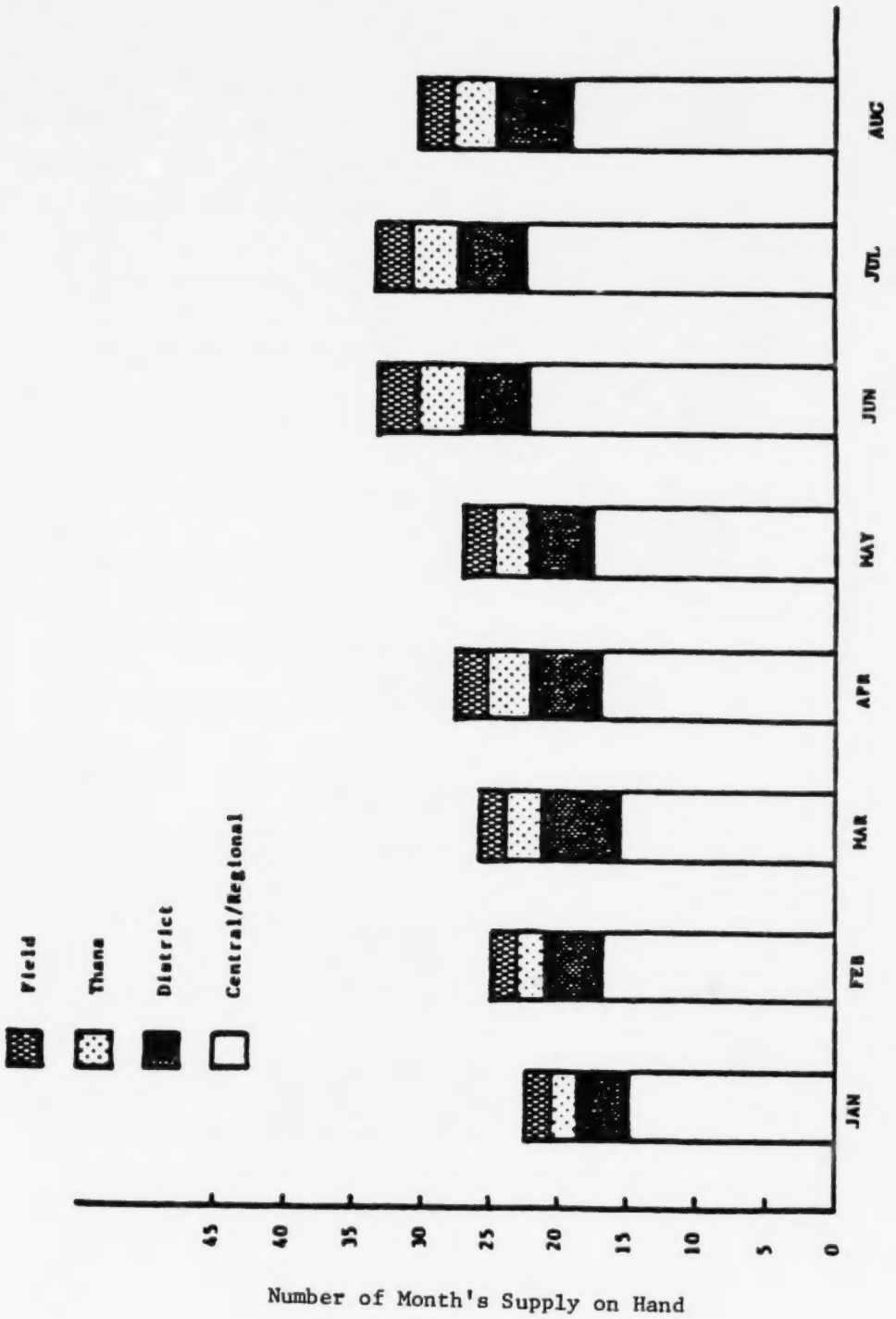


Figure 14. Monthly Supply and Usage Report Used in Haiti

DEPARTMENT OF PUBLIC HEALTH AND POPULATION
FAMILY HEALTH DIVISION

MONTHLY SUPPLY AND USAGE REPORT

Hospital _____

Region _____

Clinic _____

Period _____

Number	Description	Previous Balance	Received	Used	Present Balance

Warehouse Manager _____ Date of Submission _____

Chief Medical Officer _____ Date of Receipt _____

Central Office _____

Figure 15. Monthly Report Used in Bangladesh

PEOPLE'S REPUBLIC OF BANGLADESH - FAMILY PLANNING PROGRAMME
MONTHLY SUPPLY DISTRIBUTION AND STOCK BALANCE REPORT

☐ Thana Family Planning Office
☐ FP District Office
☐ FP District Summary of Thana Reports
☐ Other _____

Month _____ Year _____

District _____ Thana _____ Region _____

Ser. No.	ARTICLE	Store room/Warehouse								Field Distribution and Balances				Remarks
		Articles in Usable Condition					Articles in Unusable Condition							
		Balance at end of last month	Received during this month	Issued	Condemned this month	Balance at end of this month	Balance at end of last month	Destroyed this month	Balance at end of this month	Balance at end of last month	Issued to clinics/FW this month	Distributed to Clients	Field Balance at end of this month	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)

Prepared by _____
Designation _____

Reviewed and Approved by _____
Designation _____

L. Warehousing

1. Warehouse Types and Locations

Warehousing is the storage of goods to insure continuous availability. Administratively, there are three types of warehouses (or stores) in family planning programs: central, intermediate, and outlet level.

Central warehouses receive, store, and ship contraceptive commodities that have been procured from foreign sources, donor agencies, or local manufacturers. Central warehouses normally do not supply distribution points directly. Instead, contraceptive supplies move through intermediate levels, such as regional warehouses, to the outlets. Because the unit cost of shipping large quantities of contraceptives is usually lower than the cost of shipping small quantities, it is prohibitively expensive, in all but the smallest countries, to supply outlets or field workers from a single central warehouse. Large quantities of contraceptives, therefore, are shipped from a central warehouse to intermediate warehouses where distribution to lower levels takes place.

Once the number of warehouses is decided, administrative and geographical considerations determine specific locations. A single central warehouse should be located in or near production facilities, the port of entry where supplies from overseas are received, or in the country's transportation center. This warehouse (or group of warehouses) must be capable of storing the maximum months' supply for the entire country. In most programs, this would be a 1-year supply. In countries that receive frequent shipments of supplies, such as Pakistan, this could be a lesser amount.

A slightly different system is used in Bangladesh, where several regional warehouses make up the central-level storage capability and supplies are allocated to each region as they are cleared through customs at the seaport. One warehouse is in the port city and serves the dual purpose of receiving supplies and shipping them to other regions, as well as serving districts in its own region.

Intermediate warehouses usually serve entire political subdivisions such as provinces, states, districts, etc., unless geographic barriers are an impediment to easy transport. A mountain range or large river, for example, may make part of a province more easily accessible from a neighboring administrative area or directly from the central level. Intermediate warehouses should be capable of storing from 6 months' to as much as a 1-year supply.

Some countries have one or more levels of storage facilities between regional stores and the outlets. In other countries, supplies are distributed directly to outlets from regional storage facilities.

Storage facilities at outlets frequently are very simple; in a small facility, a desk drawer might be sufficient; in a larger facility, a cabinet or small room, which is cool and dry, might be necessary. Nevertheless, the principles of logistics management apply equally to all sizes of storage facilities.

2. Warehouse Size

The size of the warehouse depends on the maximum amount of inventory to be stored, which is a factor of the total amount of supplies moving through a warehouse, lead time, and safety stocks required. Space for contraceptive storage is determined in terms of the number of months' supply of major items to be stored. Calculations should take into account program expansion over the next 5 years.

Following is an example of calculations of warehouse space requirements for a typical program in which the major items are oral contraceptives and condoms. First, measure the size of the box of contraceptives and divide by the box quantity. For example, if a case of oral contraceptives containing 1,200 cycles measures 1 cubic foot (0.03 cubic meters), then one cycle will require 0.000833 cubic feet (0.0000249 cubic meters) of storage space. Similarly, if a case of condoms containing 6,000 units measures 3.8 cubic feet (0.1076 cubic meters), then one unit will require 0.0006333 cubic feet or 0.0000179 cubic meters of storage space.

Assuming that 13 cycles of pills or 100 condoms are a year's supply for an individual consumer, one can calculate the warehouse size needed to store a 1-year supply of condoms and pills for a specific number of clients. For example, if a given area in the next 5 years expe[illegible] to serve 96,000 active users per year, of whom 35 percent will use oral contraceptives and 15 percent will use condoms, we can calculate:

Pills		Condoms	
96,000	users	96,000	users
x .35		x .15	
33,600	no. pill users	14,400	condom users
x 13	cycles/year	x 100	condoms/year
436,800		1,440,000	
+43,680	10% wastage	+144,000	10% wastage
480,480	cycles of pills	1,584,000	condoms
x 0.000833	cubic feet/cycle	x 0.0006333	cubic feet/condom
400	cubic feet required for pills or	1,000	cubic feet required for condoms or
480,480	cycles of pills	1,5840,000	condoms
x 0.0000249	cubic meters/cycle	x 0.000179	cubic meters/condom
= 12	cubic meters required for pills	= 29	cubic meters required for condoms

Therefore, 400 + 1,000 = 1,400 cubic feet (12 + 29 = 41 cubic meters) of storage space are required.

To determine the exact floor space needed, the following factors must be considered:

a. Warehouses are usually measured in terms of square feet (square meters) of usable floor space.

b. Good storage practice for contraceptive supplies packed in cardboard shipping cartons requires that stacks of cartons be no higher than 8 feet (2.5 meters).

c. Net storage space required must be increased by approximately 50 percent for handling, depending on the nature of the supplies handled, the nature of the storage facility and its functions. For example, 50 percent additional storage space for handling might be sufficient if supplies are handled largely in case lots, there are not many items of supply, no repackaging is done, and supplies are merely shipped to lower level facilities. On the other hand, if large cartons of supplies are frequently repacked in smaller lots for redistribution and there are many items of supply, a greater amount of additional storage space, perhaps 100 percent or more, would be necessary.

The depth of shelving and the resulting walkways and aisles between shelves will determine, to a great extent, the additional storage space available for handling. Deeper shelves and narrow aisles reduce space available for handling.

To return to our example, we will assume that our storage facility requires 50 percent additional space for handling. By multiplying the space requirements by 1.5, we arrive at the number of square feet of warehouse floor space required for contraceptive storage and handling for a year's supply of pills and condoms. Therefore, (1400 ÷ 8 feet) x 1.5 = 263 square feet, or a room measuring approximately 13 feet by 20 feet would be sufficient for the immediate future if the maximum to be stored is a 1-year supply. In meters, this would be (41 ÷ 2.5 meters) x 1.5 = 25 square meters, or a room measuring approximately 6 meters by 4 meters.

Other contraceptive devices, such as IUD's, either do not take up much space or are not stored in large quantities; thus, their space requirements are minimal.

In many countries the number, location, and size of warehouses are a "given"; i.e., they are in place and operating and are not subject to immediate expansion. If sufficient space is not available to manage the contraceptives, then the program may be restricted to lower operating stock levels and higher transportation costs. Also, incoming shipments from abroad would have to be rescheduled for more frequent shipments and smaller amounts to prevent over-loading the system. Such rescheduling would require coordination of all agencies supplying and managing the program.

Program planners often have difficulty determining the amount of storage space required in a new program, particularly when they lack very precise data as to the number of users they expect to serve. In this situation, programs may want to consider renting a large facility for bulk storage until they can determine distribution levels and the amount of storage space required.

The shelf life of oral contraceptives and condoms under tropical conditions is generally about 5 years. However, this period may be reduced if temperatures inside the warehouse rise above 104° F (40° C) or if the items of supply are exposed to sunlight. (See Attachment 2 for details on contraceptive shelf life.) Therefore, in tropical countries, the building should be kept as cool as possible by ventilating through windows and/or louvered air vents.

To insure that contraceptive supplies do not exceed their maximum shelf life, all program levels must adopt the FIFO (First In--First Out) method of storage and distribution of supplies. In this system, cartons are clearly marked with their date of manufacture (or expiration) in large, easy-to-read numerals. Supplies should be stacked separately by year of manufacture. Cartons with the oldest date of manufacture are then issued first; cartons with later dates are not issued until all earlier-dated supplies have been exhausted. If the date of manufacture is not available, the date of receipt should be used. To facilitate use of the FIFO method, and for ease of counting when performing physical inventories, cartons should be stacked so that all dates of manufacture (or receipt) are visible.
Few programs should have more than a 2- or 3-year supply on hand at any time at all program levels combined; therefore, if the FIFO method is followed, no supplies will be kept on hand as long as 5 years.

To allow for air circulation around cartons and to minimize insect infestation, cartons should be stacked on pallets at least 4" (10 cm.) from the floor and stacked at least 1 foot (30 cm.) from any wall or ceiling. In order to avoid crushing cartons at the bottom of a stack, cartons should be stacked no more than 8 feet (2.5 meters) high. These principles are illustrated in Figures 16 and 17.

Figure 16. Model Warehouse for Contraceptive Supplies

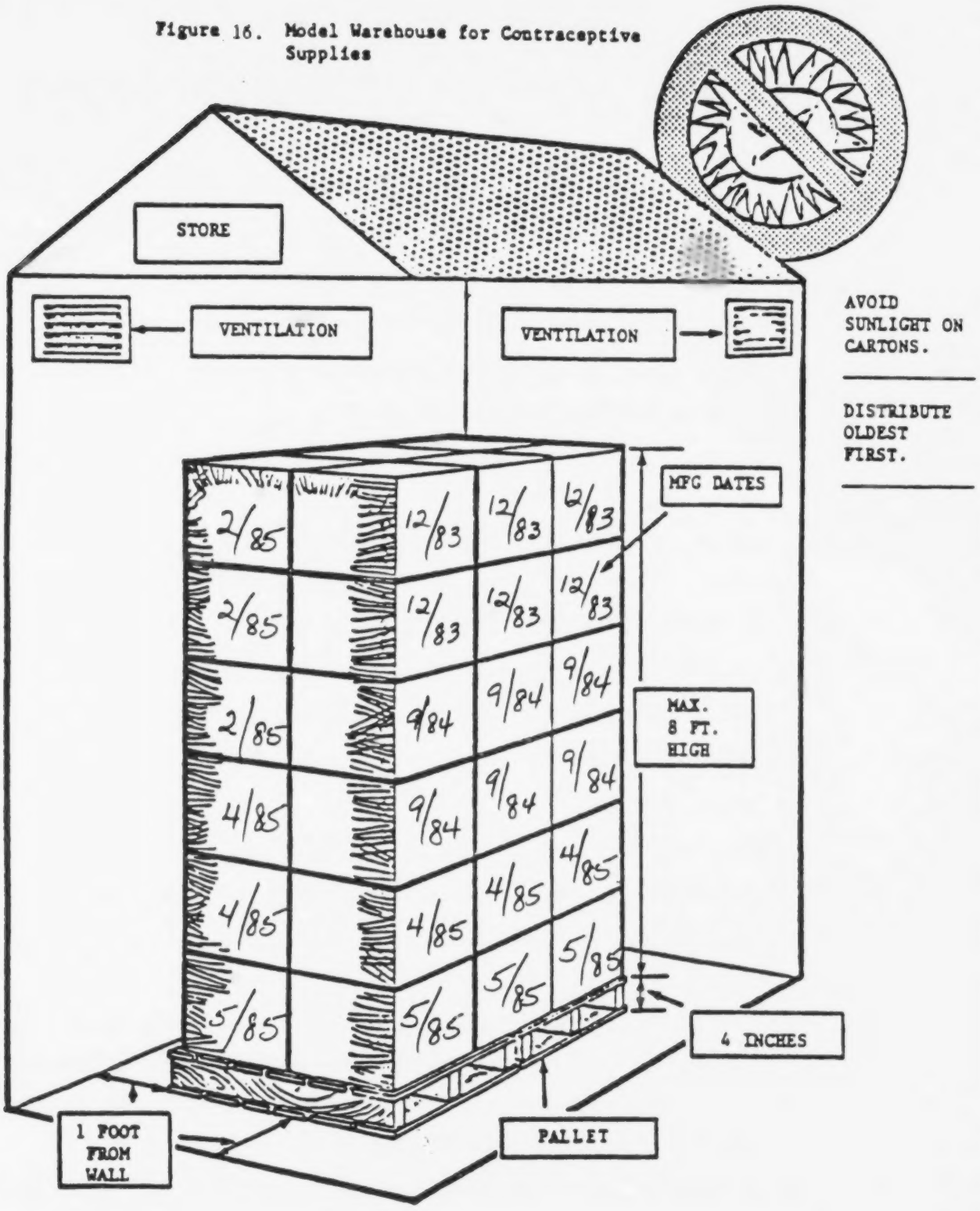


Figure 17. Storage Guidelines Used in Bangladesh

GUIDELINES FOR PROPER STORAGE

1. CLEAN ROOM AND WHITE WASH WALLS.
2. CHECK ROOF FOR WATER LEAKAGES.
3. NO DIRECT SUNLIGHT ON THE SUPPLIES.
4. STOREROOM NOT SUBJECT TO WATER PENETRATION.
5. SUPPLIES TO BE STACKED AT LEAST 4"(10 cm) FROM FLOOR (Arrange dunnage of wood or steel).
6. SUPPLIES TO BE STACKED AT LEAST 1'ft. (35 cm) FROM ANY WALL.
7. SEPARATE STACKS ACCESSIBLE FOR "FIRST IN FIRST OUT" (FIFO), COUNTING AND GENERAL MANAGEMENT.
8. STACKS NOT MORE THAN 8' ft. HGH (2·5 m).
9. IDENTIFICATION MARKS AND OTHER LABELS VISIBLE.
10. ISSUE SUPPLIES BY CARTON OR BOX LOT IF POSSIBLE.
11. WELL VENTILATED.
12 WELL LIGHTED.
13. FIRE EXTINGUISHERS NOT BLOCKED.
14. VACCINES AND SERA MUST BE STORED IN REFRIGERATOR.
15. OLD FILES, INFORMATION MATERIAL, OFFICE SUPPLIES ETC SHOULD BE STORED SEPARATELY.
16. INSECTICIDES AND OTHER CHEMICALS NOT TO BE STORED TOGETHER WITH CONTRACEPTIVES AND MEDICAL SUPPLIES.
17. THE STOREROOM TO BE DISINFECTED AND SPRAYED AGAINST INSECTS EVERY THIRD MONTH.
18 DAMAGED AND CONDEMNED SUPPLIES TO BE SEPARATED AND DISPOSED OF WITHOUT DELAY.
19. STORE KEYS MUST BE AVAILABLE AT ALL TIMES.
20. DAILY CLEANING OF STORE ROOM.

III. EVALUATION OF THE LOGISTICS SYSTEM

A. Supervisory Field Visits--Checklist

When evaluating a logistics system, preliminary observation can usually indicate how well the system is functioning and identify areas that require further investigation. Since the component activities of logistics management are highly interrelated, if a problem is found in one activity, it is likely to affect other activities.

Ideally the evaluation should start with a sample of outlets to determine whether sufficient quantities of contraceptive supplies are on hand and to evaluate storage conditions and logistics data. This initial inspection need not be in detail or in depth. If the evaluator has a strong initial impression that, in general, contraceptives are in good condition and continuously available for distribution at the field level, it can be assumed that the system is working, even if not in the most efficient manner. On the other hand, if the system is not working well, the evaluator can determine the direction and scope of further analysis. The absence of data, or data that do not tally, might indicate that conditions are not normally as good as they appear at the time of the evaluation.

To facilitate an evaluation of the logistics system, especially of the flow of contraceptive supplies at distribution points and intermediate warehouses, we recommend use of a simple checklist. Attachment 3 is a copy of the supervisory checklist being used in Bangladesh. The checklist, which is useful in identifying trends, could cover the following items:

1. Persons contacted.

2. Staffing pattern of the distribution point visited.

3. Monthly quantities of contraceptives by method and brand dispensed by outlets to consumers for the most recent 6 months.

4. Monthly quantities of contraceptives by method and brand received by the distribution point from its supplier (intermediate warehouses).

5. Monthly quantities of contraceptives by method and brand issued by the intermediate warehouse to outlets or other distribution points.

6. Monthly receipts of contraceptives by method and brand that the intermediate warehouse received from central warehouse.

7. Number of months' supply on hand for each method (quantity of each item on hand divided by 6-month moving average of items dispensed to consumers). Compare actual count with the records.

8. Frequency of stock-outs or deviations from recommended quantities to be maintained on hand.

9. Use of (and deficiencies in the use of) supply forms.

10. Variations in lead time. Is there a trend to long, short, or irregular lead time periods?

A supervisor's evaluation of a logistics system differs from an audit. The purpose of the former is to identify problems in the system so steps can be taken to correct them. An audit, on the other hand, may be conducted for more specific purposes, such as determining if the system complies with program policy and law, and if equipment and materials are accounted for. Both an evaluation and an audit are useful and should be conducted periodically.

B. Performance Problems--Outlets

1. Storage: The capacity and condition of outlets to store contraceptives varies. Field visits frequently show that some outlets can store more contraceptive supplies than they do, while others lack storage space.

   Often, storage capacity can be increased by cleaning and rearranging the existing storage area or by finding underutilized space within the facility. By increasing current stock levels, the frequency of resupply and the risk of stock-outs are reduced. However, stock levels should not be so large that commodities cannot be safely stored or that stocks are not used before date of expiration.

   Lack of security is often mentioned as an excuse for not maintaining higher stock levels. Often a small investment can be made to secure a room or to make cabinets that can be locked. In addition, the community served by the outlet may offer secure storage space.

   At times, outlets do not observe the FIFO principal of distribution. This usually happens because personnel have not been trained or do not have written guidelines on supply management.

   Finally, if more than one type of oral contraceptive is dispensed by the program, the outlet personnel may mix the different brands together in a drawer or cabinet and dispense them indiscriminately to consumers. This could lead to medically-undesirable side effects and cause consumers to drop out of the program.

2. Inventory Control: The most common problem found in outlets is a lack of inventory control procedures:

   a. Shipments are not always checked against packing lists. Shipments of supplies may be received in quantities that are more or less than those indicated on the packing list, and the difference goes undetected.

   b. The importance of properly maintained ICC's in supply management may not be understood. If ICC's are used, they might be inaccurate, not up-to-date, or missing vital information such as requisition numbers, dates, and other essential information. Thus, the quantities of stocks on hand are not known and usage rates cannot be calculated. Under these conditions, orders for

additional supplies are often made haphazardly when someone by chance discovers that a stock-out is about to occur. If ICC's are not used, the history of movement of supplies is not known, and quantities to be requested are determined on an ad hoc basic; for example, the same amount ordered last month, plus 10%. This leads to stock imbalances, or worse, stock-outs.

c. If more than one type of oral contraceptive is dispensed by the program, but monthly inventory reports contain only the aggregate quantity of orals dispensed rather than the quantities of each formulation, imbalances may occur in the different formulations available to consumers.

d. If a pull system is not supervised adequately, personnel may falsely report stock-outs and other emergency situations when they think contraceptives are in short supply at intermediate and central levels. Outlet personnel assume that there is a greater probability of receiving the items asked for if they report lower amounts on hand.

C. Performance Problems--Central and Intermediate Warehouses

1. Stacking of Contraceptives: If cartons of contraceptives are stacked so that labels are not visible, it is possible that:

   a. The First-In/First-Out (FIFO) principal of supply management is not being observed. If this is the case, the warehouses, as well as the distribution points, may be issuing/dispensing newer stocks of contraceptives before they issue/dispense contraceptives with older manufacturing dates. At some time in the future, some supplies on hand will expire.

   b. Different commodities are stored together. Many types of oral contraceptives are boxed in similar containers. If these contraceptives are indiscriminately stacked together, personnel working in the supply system and at distribution points may be unaware of differences in formulations. Receiving different types of oral contraceptives in a single shipment may indicate to them that there are no differences. Thus, consumers may receive one type of oral contraceptive during one visit and another type on the following visit.

2. Broken Lots: Central warehouses should manage contraceptives in case lots. For example, orders for oral contraceptives should be filled in carton lots of 1,200 cycles and orders for condoms in lots of 6,000 units. If possible, intermediate warehouses should also manage contraceptives in carton or package lots. For example, the present shipping cartons of Femenal contain 12 packages of 100 cycles each and condoms are packed as 60 packages of 100 each. Because of low patient loads, some outlets will require fewer than 1,200 cycles or 6,000 condoms when they are resupplied by the intermediate warehouse. In this case, intermediate warehouses should issue oral contraceptives in package lots of 100 cycles and condoms in package lots of 100 units.

The same principals should be applied to contraceptives purchased locally or supplied by other donors, regardless of quantity per carton.

Broken lots encountered during an inspection of a central or regional warehouse facility indicate that:

a. Contraceptives are not being warehoused and shipped in carton lots, thus decreasing the efficiency of the warehouse operations. It may also indicate that lower levels have not been instructed to order in carton or package lots.

b. The warehouse is receiving damaged or pilfered shipments or that commodities are subject to pilfering or pest infestation in the warehouse.

c. The maximum months' supply and minimum months' supply levels assigned to a given distribution point are too low or are not being followed, resulting in the need for fill-in orders. (Fill-in orders should be avoided, since they are costly to process and require the inefficient use of transport.)

3. Inventory Control Cards: An inventory control card should be maintained for each item in inventory, that is, for each brand of oral contraceptive, condom, etc. Otherwise, some commodities may become "lost" in the warehouse and will not issued to the distribution points before their shelf life expires. In addition, the rate of distribution of different brands, formulations, or types cannot be determined, which can result in inaccurate forecasting.

A review of the ICC's and receipt/issue voucher files maintained by the central and intermediate warehouses and the use of the checklist will reveal:

a. The size and frequency of shipments to the next lower level. If a given location has been issued small quantities of supplies on a frequent basis, this may indicate that supply levels for this facility are too low, storage space at the facility is inadequate, or that transportation facilities are being inefficiently used.

b. Bottlenecks in the flow of supplies. A comparison of the ICC's maintained by central and intermediate warehouses and/or an analysis of supply data at the national level may indicate that large quantities of supplies are being moved from the central to the regional warehouses, but that movement from the regional to the lower-level distribution points is somewhat less. In this case, the regional warehouses will eventually reach their capacity. This indicates that problems may exist in the flow of information and supplies between the intermediate warehouses and the distribution points, and that supply policies practiced at the central level are not being applied in the field.

c. Incorrect operation of an allocation (push) system. A frequent problem is that all distribution points of the same type are periodically shipped the same quantities of contraceptives. This results in imbalances (over- and under-supply) in the system because demand for family planning services varies from one facility to another. For example, visits to different outlets served by an intermediate warehouse might reveal one outlet with a 2-year supply of a specific contraceptive while another has insufficient quantities of the same item. During these visits an evaluator can determine, using the checklist, if the staff at the family planning outlets served by the warehouse are trained and qualified to offer methods of contraception that may require specialized knowledge, i.e., IUD's and diaphragms. If these methods are on hand, and no one is trained to insert an IUD or fit a diaphragm, the supplies should be moved to a facility that can use them.

d. Variations in lead time. For the system to work efficiently, lead time should be reasonable and consistent.

4. Physical Inventory: Comparing the results of a physical inventory with the ICC can reveal if the ICC's are up-to-date and accurate. Here again, the checklist is useful. If the physical inventory and the quantities recorded on the ICC's vary by more than small amounts, there has been pilferage or other losses, shortages in shipments, or clerical errors.

5. Forms and Reports: The presence or absence of forms, especially ICC's and RIV's, indicates how well the logistics system is managed. In some programs, requests for supplies are made informally, i.e., by telephone, telegram or note, with little documentation of issues and receipts. Similarly, the absence or presence of reports will indicate if someone is paying routine attention to simple performance indicators such as (a) the average number of the different type of contraceptives on hand in the outlets as related to demand; (b) the proportion of outlets with stock levels below the minimum, or above the maximum, desired supply; (c) the number of emergency shipments sent out from the warehouse in a given month; (d) the average and range of lead time; and (e) inventory fluctuations. In addition, the absence of supply data and reports indicates that forecasts of contraceptive needs are not based on demand.

6. Documentation of the System: In many programs the supply system procedures are not documented, and supply personnel below the central level are not always trained in supply management. In this situation, decisions are often made on an ad hoc basis.

Supply system procedures should be documented so personnel at all program levels can be given written supply management guidelines. In addition, management personnel at all levels in the program should be trained in the procedures of the system. A task of program supervisors should be periodic evaluation of the supply system during routine

supervisory visits. The supervisors' training must be thorough, and they must have a complete understanding of the supply system. The value of good supervision in any supply system cannot be overemphasized.

D. Performance Problems--General

1. Deterioration of supplies and/or packaging materials because of water, heat, insect, or other damage. Even if the contraceptives are usable, they may not be attractive to users if packages are broken, dirty, or shopworn.

2. Insufficient funds are budgeted for transport. A related problem arises in programs which distribute supplies by having field personnel come to the warehouse to collect supplies by public transport, and insufficient funds are budgeted for this purpose or reimbursements are not paid quickly.

3. FIFO procedures are not followed. Contraceptives in central warehouses are sometimes older than those found in clinics or other outlets.

4. There is a lack of data on quantities being dispensed to users and quantities on hand. The result is that historical data are of poor quality or do not exist, thus obscuring changes in demand. This causes serious problems when forecasts are being prepared.

5. Poor documentation of transactions within the system makes it more difficult to detect problems.

6. Management of the logistics component of the program is relegated to a low-ranking official with insufficient experience or authority to correct problems.

7. The logistics component is frequently of low priority in terms of allocation of funds, resulting in poor service to the outlets.

8. Lower-level staff are poorly supervised, so they do not understand their tasks or do not think the tasks are important.

In summary, this section has discussed examples of the most common problems found in supply systems. Other problems do occur and can be detected by inspection of warehouses and inventory records as well as by careful questioning of personnel at all levels in the system. Basic questions are:

1. When should orders for additional supplies be made?

2. How are the quantities to be ordered determined?

3. What are the usage rates of the different items of supply and what program changes are anticipated that would change the rates?

4. How frequently are emergency orders made?

5. How long is the lead time for supplies ordered, and is it consistent? Where are supplies ordered from, and what is the usual route and mode of transport used?

Operating a successful logistics system is a common-sense proposition, and any problems that arise are often easily detected. Organizational factors are also determinants of a successful system. Government procedures, bureaucratic rigidities, and an ill-defined scope of responsibility for supply management personnel can constrain a logistics system. Once these constraints are identified and understood, the logistics system can be modified accordingly.

IV. SUPPLY DATA ANALYSIS

A. Program Efficiency

Supply data can provide an effective estimate of family planning program efficiency at all administrative levels. These data include the total amount of contraceptive supplies dispensed and the balance of supplies on hand at the end of the month. With these data, the supply status of the program can be expressed in terms of the number of months' supply on hand, by method. These data should be reported by all program levels and should be analyzed by supervisory staff. Sudden fluctuations in amounts dispensed to users, or inventory levels that differ from desired maximum and minimum levels, may indicate deficiencies.

An example of a report based on these data for several clinics in a district is shown below. An asterisk (*) indicates that a stock level is not in compliance with program policy.

DISTRICT X
MONTH: A

MIN - MAX NUMBER MONTHS SUPPLY
CLINIC MIN-2, MAX-4
DISTRICT MIN-4, MAX-8

Clinic Name	Pill (Cycles) Dispensed to Users (6 Mos. Aver.)	Pill (Cycles) Stock End of Month	Pill (Cycles) No. Mos. Supply in Stock	Condoms (Units) Dispensed to Users (6 Mos. Aver.)	Condoms (Units) Stock End of Month	Condoms (Units) No. Mos. Supply in Stock	Foam (Tubes) Dispensed to Users (6 Mos. Aver.)	Foam (Tubes) Stock End of Month	Foam (Tubes) No. Mos. Supply in Stock
A	255	918	3.6	960	3,750	3.9	92	278	3.0
B	103	452	4.4	324	580	1.8*	36	75	2.1
C	137	310	2.3	420	1,130	2.7	24	8	3.3
D	89	137	1.5*	280	460	1.6*	12	30	2.5
E	198	560	2.8	540	1,730	3.2	48	178	3.7
F	72	210	2.9	220	500	2.3	22	40	1.8*
District Total	854	2,587	3.0	2,744	8,150	3.0	234	609	2.6
District Warehouse		3,860	4.5		23,598	8.6*		1,320	5.6

* Stock is not within the desired supply limits. (The number of month's supply at all program levels is basedon quantities distributed to consumers as the denominator.)

In this example, clinics B, D, and F, and the district warehouse, have stock levels that fall outside those desired for one or more methods. Clinic B should order condoms and foam, but postpone ordering pills. All other clinics should order all supplies to bring all inventory levels up to maximum months' supply.

This example illustrates that supply imbalances can exist at different levels of the program. An imbalance may be due to the following:

1. Changes in supplies dispensed to users or issued to lower levels from central or intermediate warehouses. This indicates that the system is not keeping up with changes in program performance; a detailed study might be needed to determine whether the problem is specific to certain areas or items, or is a more general problem.

2. If an oversupply at a higher level is accompanied by an undersupply at a lower level, the supply system is not properly meeting demand at the lower level. This most likely would be seen in a national level analysis if the problem exists in one or more regional warehouses. In some countries, supply personnel are overly conservative when filling requests from lower levels, particularly when large amounts are involved.

3. An oversupply at the central level may indicate that projections of program performance have not been attained, or supplies are not moving down the system according to program policy.

4. If undersupply is a problem at all levels, either performance exceeds projections or adjustments are not being made in the quantities that represent a month's supply. An undersupply of this type is more apparent at lower levels.

5. An undersupply at the central level may indicate a shortfall of supplies being procured because of inaccurate forecasting, insufficient lead time in placing orders, or difficulties in clearing commodities through customs.

B. Estimating Couple-Year of Protection (CYP)

Statistics systems for family planning program services often produce inaccurate data on "active users" of a program, which is one of the most important measures of program output. In this section, another method of measuring family planning output is described: the CYP index, which summarizes the overall output of a program in terms of potential contraceptive protection dispensed by the program.

The CYP index provides a way to determine the total contraceptive protection offered by different methods issued by a program during a certain time period. One CYP is equal to 12 couple-months of protection, which could be attributed to any person-time combination, from one couple practicing birth control for one year to 12 couples practicing birth control for 1 month each. Thus, 12,000 CYP's of oral contraceptives dispensed to users is enough to meet the contraceptive needs of 12,000 couples for 1 year, or 24,000 couples for 6 months, etc. Thus, CYP indicates how much contraceptive protection time could result from the quantity of contraceptives dispensed.

The procedure for estimating CYP consists of three steps:

1. From the inventory control cards, obtain the quantities for each method dispensed during the time period. This information should come from records of outlets. However, information is often not easily available from outlets, in which case quantities being dispensed are estimated from higher-level data.

2. Determine the amount of each method needed to provide one CYP. This may vary from country to country, program to program, and from region to region. Preferably, the program manager will compute these factors for himself from local studies. However, in some instances a program may have to use estimates from relevant experience elsewhere. The figures most frequently used are:

   a. Without counting wastage, it takes 13 cycles of oral contraceptives to protect a couple from the risk of pregnancy for 1 year.

   b. On the average, couples use 100 condoms per year.

   c. On the average, one tube of cream, jelly, or foam confers 3 months of protection. Thus, it takes four units to provide one CYP.

   d. On the average, one tube of Neo-Sampoon (20 tablets) confers 2 months of protection. Therefore, six units are needed for one CYP.

   e. Each contraceptive injection confers 3 months of protection. Thus, four injections provide one CYP.

To calculate CYP for each method, simply divide the quantity of each contraceptive method dispensed by the average quantity of each method used by a couple in a year, or its conversion factor. These results can be totaled as shown in the following table:

Contraceptive Method (1)	Amount Issued (2)	Average No. Needed Per Couple Per Year (3)		CYP Achievement (4)=(2)-(3)
Pill	290,416	13 cycles	=	22,340
Condom	193,596	100 units	=	1,936
IUD	540	0.4 units	=	1,350*
Cream, (including diaphragms)	1,116	4 tubes	=	279
Neo-Sampoon	2,491	6 tubes	=	415
Injection	9,260	4 injections	=	2,315
		TOTAL		28,635

*Studies have shown that an IUD is kept in place an average of 2.5 years. Therefore, the average use per year is 1 year divided by 2.5 or 0.4 units. Diaphragm usage is calculated as part of the accompanying cream usage.

Thus, this example shows that 28,635 users were served during the year. Stated more precisely, contraceptives sufficient to provide 28,635 couple-years of contraceptive use were dispensed through program activities during the year.

This type of analysis can be done by clinic or region, or for the entire program. In addition, monthly or quarterly data can be analyzed by converting annual usage rates to either monthly or quarterly rates. For example, the quarterly usage rate for orals is 3.25 cycles (13 divided by 4).

C. Comparing Program Output

It is important to know how regions, health areas, districts or other subdivisions compare in overall success and whether total output is decreasing, increasing or remaining the same. The CYP Achievement index provides a way to compare contraceptive protection offered by different program subdivisions. For example, the CYP Achievement of several program subdivisions can be compared over time, as illustrated in the two examples below.

EXAMPLE 1

Program Region	CYP Achievement by Year				Percent Change Over Previous Year			
	1976	1977	1978	1979	1976	1977	1978	1979
I	8,714	9,505	11,862	13,444	-	+ 9.1	+ 24.8	+ 13.3
II	9,533	10,698	14,035	16,742	-	+ 12.2	+ 31.2	+ 19.3
III	14,002	16,225	18,490	18,375	-	+ 15.9	+ 14.0	NC
IV	2,669	1,719	1,592	2,503	-	+ 1.9	- 4.7	- 3.4
V	7,420	4,674	5,818	7,319	-	+ 37.0	+ 24.5	+ 25.8
TOTAL	42,338	43,921	52,797	58,383	-	+ 3/5	+ 20.5	+ 10.6

EXAMPLE 2

Program Region	Percent Distribution of CYP Achievement Issued			
	1976	1977	1978	1979
I	20.6	21.7	22.5	23.0
II	22.5	24.4	26.6	28.7
III	33.1	37.0	35.0	31.5
IV	6.3	6.2	4.9	4.3
V	17.5	10.7	11.0	12.5
TOTAL	100.0	100.0	100.0	100.0

In comparing program outputs using the CYP Achievement index it is important to take into account the population of each program region. In Example 1, Program Region III consistently outperformed the other program regions in terms of quantities of contraceptives dispensed to users. However, depending on the size of the population, the region's rank could change from first to last place.

The population data normally used in estimating program coverage are the number of married women 15-44 years of age. Some countries use the total number of women 15-44, regardless of marital status. These data are usually found in published census documents. Estimates of the number of married women 15-44 years of age can also be obtained from published results of sample surveys, such as the World Fertility Studies and Contraceptive Prevalence Surveys.

Thus, the procedure for estimating CYP Achievement in terms of population covered consists of three steps:

1. From recent census volumes or relevant sample survey reports, obtain the number of married women 15-44 years of age living in the program subdivisions under study.

2. Calculate the CYP Achievement for these subdivisions.

3. Divide the CYP Achievement of each subdivision by the number of married women 15-44 years of age living in each subdivision and multiply by 100.

The percentage of the population covered by the program is estimated using CYP, as in the following example:

Program Region (1)	CYP Achievement 1979 (2)	Married Women 15-44 (3)	Percent Coverage (4)=(2)-(3) x 100
I	13,444	263,608	5.1
II	16,742	201,711	8.3
III	18,375	680,556	2.7
IV	2,503	125,150	2.0
V	7,319	159,109	4.6
TOTAL	58,383	1,430,134	4.1

In calculating CYP Achievement it is necessary to make certain assumptions. These include that all supplies are used and that there is no hoarding, wastage, or improper use of contraceptives by clients. The most important assumption is that the estimates of the average number of items used per year (particularly those other than pills and injections) are accurate. However, CYP Achievement is still a useful measure of program performance for management purposes, particularly when comparing one time period with another.

V. FORECASTING

"Forecasting" is predicting future events and is a primary component of logistics management since other components of the logistics system depend on the quantities of supplies to be managed. However, logistics forecasting includes not only the quantities needed but also scheduling their timely arrival. Since requisitions and manufacturing schedules are based on these estimates, overloading or depletion of supplies will occur if the degree of error is high.

This manual already has described some of the principles of logistics management and related problems. The efficiency of the system--i.e., the relationship between input and output--depends heavily on the program's ability to forecast its needs accurately. Forecasting involves not only the quantities needed and when they will be needed, but also the changes that will be required in procedures, transportation, and storage facilities. This fact is frequently overlooked.

In its simplest form, forecasting occurs when the person responsible for supplies in a small outlet submits a requisition for contraceptive needs. Forecasting for total program needs, however, is vastly more complex. Most programs have multiple sources for the different contraceptives procured through donations or loans or purchased with program funds. Lead times vary with different supply sources and even with different items coming from the same source. Lead times are short for items bought off the shelves of a local supplier but can be a year or more for the procurement of large quantities that actually are not scheduled for manufacture until the requisition has been received. The time required to secure funding can also be critical. Forecasting must be done far enough in advance to secure funds for timely procurement of the goods.

Forecasting is, at best, educated guesswork. Greater precision can be achieved by collecting, processing and analyzing data relevant to future program needs. Information on future program plans that affect the needs for different types of contraceptives should be made available and studied those responsible for forecasting. Obtaining this information will be more difficult and the forecast will usually be less accurate for new programs than for those that have been operating for several years.

A. The Forecasting Process

Forecasting contraceptive needs in new family planning programs usually begins with estimating the target population. This is expressed as a percentage of married women of reproductive age (MWRA) in the population of the country. A program's goal might be to provide family planning services to all who want or need these services and to reduce the rate of natural population increase to a certain percentage by a certain year. To reach the population growth goal, program planners estimate the proportion of MWRA who must practice contraception in order to reach that goal. Replacement population is reached when women bear an average of 2.1 to 2.4 children during their lifetime (depending on the infant mortality rate). To accomplish this, approximately two-thirds of MWRA must be practicing contraception. Note that the two figures quoted are estimates, and the population to which these figures are applied is an estimate; therefore, in countries with poor census data, it could be a poor estimate.

The next step is to estimate the proportion of the target population that will use the services of the program. This requires knowledge of other sources of contraceptive services within the country and the number of users they serve. Other sources would include both public and private agencies, formal programs, and pharmacies.

After estimating the number of users to be served by the program, the next step is to estimate the proportions of that number who will use the different contraceptive methods. The quantity of each method required to serve one consumer for a year is relatively fixed. This figure is then used to calculate overall quantities of contraceptives that must be procured by the program each year for the duration of the projection, usually 5 years. These figures are used to prepare purchase orders or requests from donor agencies. Programs that purchase these items must estimate their cost and secure funding. As part of procurement, shipping schedules are designed so that the systems and facilities necessary for handling the commodities can be updated or established.

Although programs sometimes operate on multi-year plans, this does not mean that forecasting is done only once. Since the entire process is based on estimates, and some of the assumptions underlying these estimates are subject to rapid change, the forecast must be constantly updated. This should be done at least once a year, and more often when changes in program policy, demand for a particular method, or other events occur that affect requirements. For this reason, the program must produce and analyze data on the number of consumers served for each brand or formulation of the same type of contraceptive method and on the quantities of each contraceptive item being dispensed to consumers. The reasons for changes must be understood so that procurement quantities and schedules can be changed.

B. Estimating the Target Population

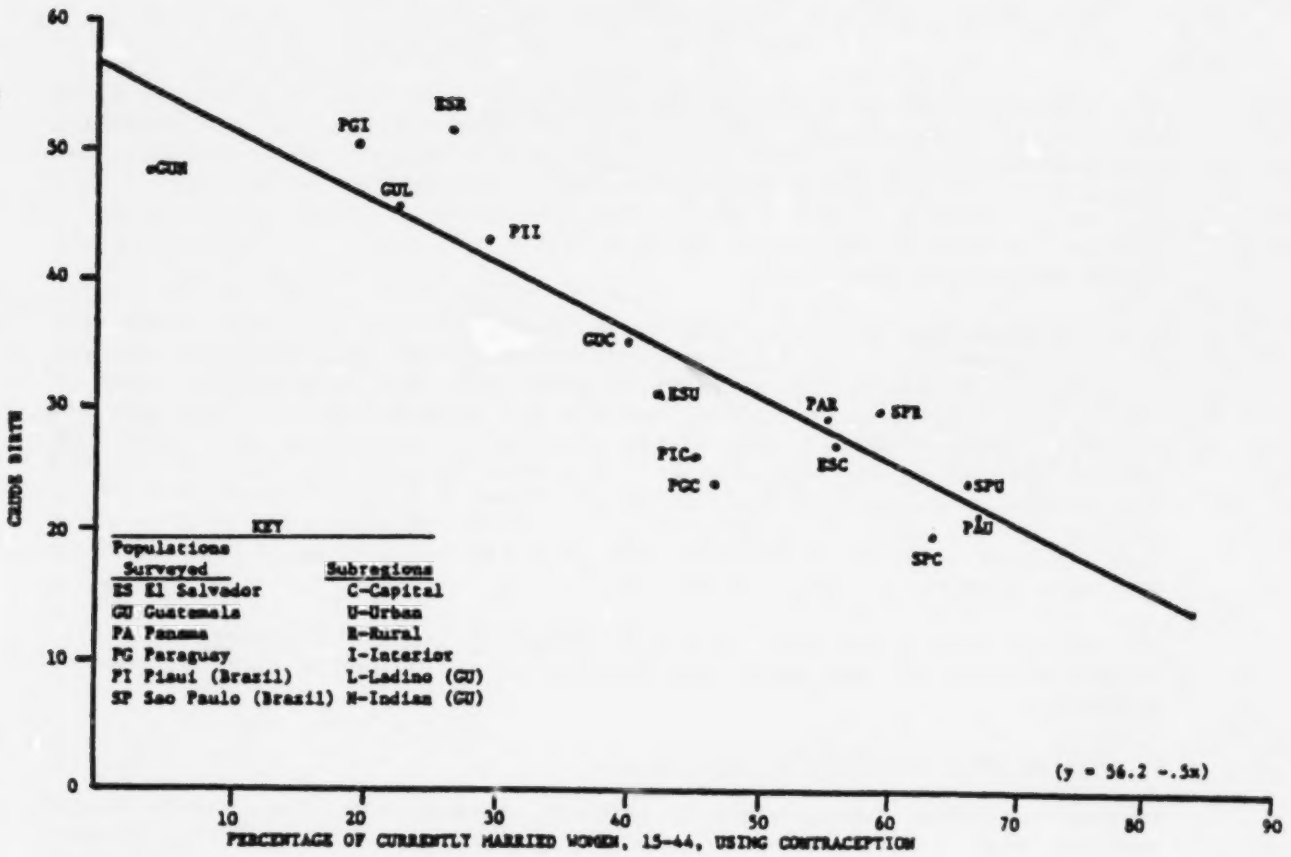
Some family planning programs have census data readily available. If not, programs can obtain demographic information from the local census bureau or its equivalent. Additional information may be available from the United Nations and other agencies.

The kinds of information needed are population by age, sex, marital status, residence, occupation, education, and other classifications that might affect the practice of contraception. Estimates for forecasting are often based on the MWRA, with adjustments made for these other factors. Most family planning programs also have service statistics on the numbers of users by contraceptive method. Program data may need to be adjusted because some outlets do not report, and definitions of active users may vary among programs. Some programs set goals in absolute numbers by planning to serve a specific number of couples rather than a percentage of the total population; sometimes these goals are method-specific. Forecasts are then based on these numbers.

Other programs express goals as a reduction of the crude birth rate (CBR). Data are available from studies that relate the crude birth rate to contraceptive prevalence. Contraceptive prevalence surveys conducted with Agency for International Development/Centers for Disease Control assistance yield the relationship shown in Figure 18.

Figure 18

Contraceptive Use and Crude Birth Rate, 15 Subregions,
6 Contraceptive Prevalence Surveys



In tabular form, these data are:

Estimated Level of Crude Birth Rate*	Estimated Proportion of Married Women 15-44 Years of Age Using Contraception
45	.22
40	.32
35	.42
30	.52
25	.62
20	.72

*Number of births per 1,000 population

If a program's goal is to reduce the crude birth rate from 40 to 30 per 1,000 population, approximately 52 percent of MWRA would need to practice contraception during the final year of the plan. The rate of 40 suggests that approximately 32 percent of MWRA are now using a contraceptive method. If the plan being designed is for 5 years, then the annual increase in contraceptive use is 4 percent. The target for the first year might be 36 percent, the second 40 percent, and so on.

Other factors that may affect the relationship between the crude birth rate and contraceptive use are the age-sex distribution of the population; the age distribution of users; the relative effectiveness and continuation rates of the methods employed; fertility outside of marital unions; incidence of abortion; breast-feeding patterns; the practice of postpartum abstinence; and seasonal migration for employment. The simple relationship between the CBR and contraceptive prevalence cannot be considered a refined demographic model; however, it can show the general level of fertility associated with a given level of contraceptive prevalence, and thus can be used as a rule of thumb when more complex data are lacking.

If contraceptive prevalence or World Fertility Survey data are available, program planners can use those data to estimate the number of women in need of services.

C. Estimating Program Participation

In most countries, family planning services are available from private sector sources, such as pharmacies and private clinics, as well as nongovernment agencies, such as affiliates of the International Planned Parenthood Federation (IPPF) and the Association for Voluntary Sterilization (AVS). Therefore, the forecaster must estimate the numbers of couples who will use the services of these agencies. Nongovernment agencies should have data on the numbers being served, but the data may be of poor quality because of incomplete reporting and differences in definitions. The number of users in the private sector is difficult to estimate unless good data are available from customs sources on imported contraceptive products. In general, the Contraceptive Prevalence Survey (CPS) provides the best estimate of the proportion of users served by the program.

D. Estimating Proportions of Each Method

Contraceptive prevalence surveys also provide data on the methods being used and some of the characteristics of users and non-users of contraceptive services. These data are particularly good if several surveys have been conducted over time. Another good source for these data is the program's logistics and service statistics systems.

While historical data are helpful, the proportion of clients using each method will not remain constant. An important consideration is whether the method was freely and constantly available over the time period being studied. Program data may falsely indicate a decline in demand during a period of shortage.

"Full supply analysis" attempts to answer the question, "What would the demand have been if there had been no shortages?" This analysis will show the negative effect of a shortage on methods in short supply and its positive effect on others; that is, consumers choose the second method, because the first was not available.

Another factor is the program plan. Management may plan to continue the program as it is, to emphasize certain methods over others, to introduce methods not previously available, or to expand geographically into new target areas.

After the proportions have been estimated, quantities must be calculated. These calculations are related to the calculation of CYP discussed earlier. For some methods, it is easy to estimate the quantities needed to provide a year's protection. For example, most oral contraceptives are based on 28-day cycles; therefore, 13 cycles of pills will be needed to supply a woman for a year (365 days - 28days = 13 cycles). Injectables are administered quarterly, therefore four injections will be needed per year. The quantities needed for condoms and IUD's are more difficult to estimate. In some programs, 100 condoms is equivalent to a year's use; however, the quantity varies from 75 to more than 200. Most programs estimate the life of an IUD to be 2 to 3 years. Many programs add an arbitrary 10% to total quantities of all contraceptives to compensate for losses. If a program keeps good data, quantities used and waste factors can be more precisely calculated.

Figure 19 is an example of the final figures that would be produced by this forecasting process. Attachment 4 contains instructions for completing contraceptive procurement tables for every U.S. AID mission which receives contraceptives through the central procurement process.

E. Preparing Shipping Schedules

After the quantities of each contraceptive are estimated for each year of the 5-year plan, the next task is to schedule shipments from the supplier. The first consideration is to estimate the quantity of each contraceptive that will be on hand at all program levels at the beginning of the first year. The desired maximum and minimum stock levels must then be calculated for each

LOGISTICS ANALYSIS TABLE
(in 000's)

FY 1986 ABS
Country: Haiti
Program: Bilateral
Product: Condom 52 colored
Source of data for Beginning-of-Year Stock: Central Warehouse

DATE: May 1984

	CALENDAR YEARS 1984	1985	1986	1987	1988
1. Beginning-of-Year Stock (PLEASE READ INSTRUCTIONS TO FILL IN THIS LINE ITEM)	1600	7000	7000	5250	
PLUS					
2. New Supply of Same Product					
(a) AID supplies received in 1984 to date	4400				
(b) additional AID quantities scheduled for shipment but not yet received	8000	7000			
(c) other sources of supply of same product (host country/other donors)	0	0	0	0	0
MINUS					
3. Estimated Product Use	7000	7000	7000	7000	7000
MINUS					
4. Desired End-of-Year Stock Level (equal to ___% of estimated use in subsequent year)	5250	5250	5250	5250	5250
EQUALS					
5. NET SUPPLY SITUATION/AID REQUIREMENT (negative number signifies additional supplies of product required from AID; positive number signifies no AID requirement and need to calculate line item #6. (1+2-3-4-5)	1750	1750	- 5250	- 7000	- 7000
6. Estimated End-of-Year Stock Level SEE INSTRUCTIONS FOR THIS LINE ITEM. (4+5=6)	7000	7000			

Figure 19

contraceptive at every program level. The first year's shipments should take this information into consideration, and planners should schedule less if there is a surplus and more if there is a shortage. Next, the storage capacity of the system must be considered. For example, if the capacity of the central warehouse is only sufficient for 1 year's supply of the supplies in question, then incoming and outgoing shipping schedules must be set so that this quantity is never exceeded. (Methods for calculating the space required were given in Section II, pages 36-39.) Therefore, the frequency of resupplying intermediate level warehouses from the central warehouse will strongly influence the choice of schedules for incoming shipments, as will the capacity of the central warehouse.

In forecasting, it is almost impossible to know the precise dates when shipments from overseas will arrive. However, shipping documents are usually available well in advance of actual shipments so that action can be taken to prepare for clearing the supplies through customs. Arrival of large shipments can be disruptive if warehouse staff must be temporarily reassigned to assist with the incoming shipment. Such temporary disruptions reemphasize the need for safety stock at intermediate and field levels so that outlets will not run out of stock if deliveries are delayed for a few days. It is usually better for the manager to schedule outgoing shipments ahead of the anticipated arrival of new stocks so that room is available for storing the incoming supplies.

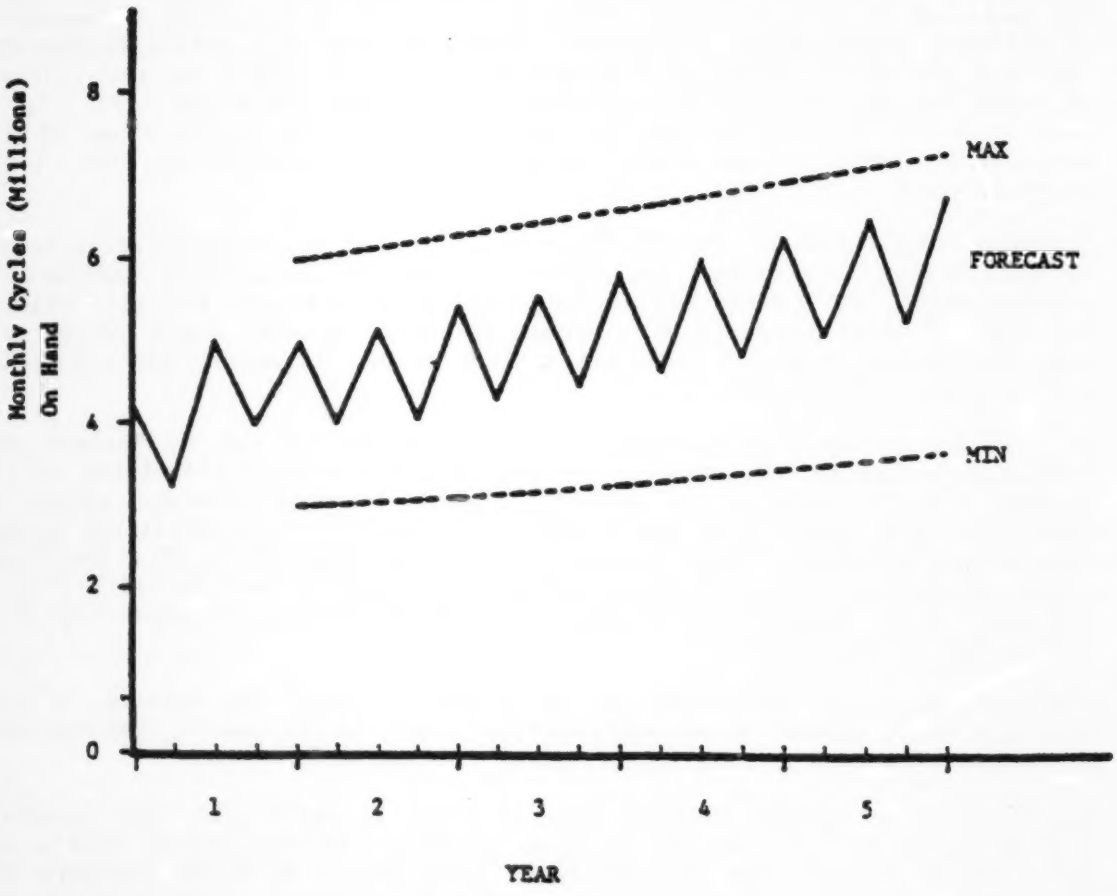
Shipping schedules should be developed, beginning at the lowest program level, to assure that inventories are maintained between the desired maximum and minimum quantities. These quantities will not be the same for all outlets. It is not unusual to maintain a higher number of months' supply at outlets that are located in remote areas and smaller amounts in easy-to-reach outlets, such as those in the capital.

Once maximum and minimum quantities have been determined for all outlets that will operate during the planning period, outgoing shipping schedules can be planned for the intermediate warehouse. The incoming schedule should be planned so that the desired maximum-minimum quantities are maintained at the intermediate warehouse. This process is continued until the central warehouse schedules are determined. Storage and shipping capacity must be calculated at the time the shipping schedules are being planned to identify those locations with under- or overcapacity.

The stock level of each item can be graphed to show the balance on hand according to projected issues and receipts. Real levels can be compared with a graph of this type to show any deviation from the plan.

Figure 20 is an example of this type of graph in which projected inventory levels are shown for the end of each quarter. If the actual levels are consistently higher than the forecast, then the program is probably not dispensing as many cycles as had been planned or incoming shipments are larger or earlier than planned. If the levels are lower than the forecast, the program may be dispensing more than projected, or incoming shipments might have been less than requested or late. Follow trends so that corrective action can be taken before inventories get too far out of balance, particularly when long lead times are involved.

Figure 20. Graph of Inventory Levels of Oral Contraceptives Based on Forecast For Five Years



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ATTACHMENT 1

GLOSSARY

Commercial Retail Sales (CRS)--Contraceptive sales through existing private commercial channels, usually at a subsidized price, whose aim is to take advantage of existing private sector logistics systems to make contraceptives widely available.

Couple-Years of Protection (CYP)--The amount of contraceptive protection provided by a program in a given time period. It is calculated by dividing the quantity of a given contraceptive method by the number of units of that method normally used by a couple during the time period in question. For example, if 26,000 cycles of pills are distributed by a program in one year and a couple would normally use 13 cycles per year, then 26,000 divided by 13 equals 2,000 couples protected for the year, or 2,000 CYP.

Dispense--The provision of an item of supply to its ultimate user by a contraceptive outlet, distribution point, clinic, household distributor, etc..

Drawdown--Amounts issued or distributed over a period of time.

Fill-In Order--Nonroutine order when it is anticipated that a stock-out will occur before the next routine order can be filled.

First-In, First-Out (FIFO)--A method of managing supplies in a storage facility to ensure that all stock which is received earliest is issued before stock received later.

Inventory Control Card (ICC)--A stockkeeping record.

Issue--The provision of an item of supply by one storage facility to another.

Lead Time--The time required between the realization of need and the delivery of supplies.

Married Women of Reproductive Age (MWRA)--The target group for most family planning programs. Other programs may also target unmarried women, particularly adolescents.

Maximum Month's Supply--minimum month's supply plus the lead time. Routine stock orders should bring inventory levels up to this point.

Maximum Quantity--actual quantity of articles represented by maximum month's supply. The point above which inventory levels should not rise under normal conditions.

Method--A contraceptive method, such as oral contraceptives, IUD's, condoms, etc.

Minimum Month's Supply--the lead time under the worst possible conditions, plus safety stock.

Minimum Quantity--Actual quantity of articles represented by minimum month's supply; the point below which the inventory level should not fall under normal conditions.

Offtake--Amounts issued or distributed over a period of time.

Operating Stock--The difference between maximum and minimum quantity. The quantity represented by the lead time.

Order Interval--The time period between the placement of routine stock orders.

"Pull" or Requisition System of Supply--Decisions on the timing and quantity of shipments are made by the lower administrative level or recipient.

"Push" or Allocation System of Supply--Decisions on the timing and quantity of shipments are made by the higher administrative level or the shipper.

Requisition and Issue Voucher (RIV)--A stock transaction record.

Resupply Interval--How often a distribution point must be resupplied to maintain its inventory level between maximum quantity and minimum quantity. The resupply interval is the number of months represented by the difference between maximum month's supply and minimum month's supply; it is also the order interval.

Safety Stock--A stock reserve for unanticipated increases in demand, or breakdowns in the supply system.

Stock Keeping Record--Documents number of items on hand in a storage facility. Example: Inventory Control Card.

Stock Order--Routine prescheduled order.

Stock-out--Occurs when a storage facility has no stock on hand of a particular item of supply.

Stock Transaction Record--Documents that initiate or support receipts and issues at a storage facility. Example: Requisition and Issue Voucher.

ATTACHMENT 2

The following information has been prepared by the Office of Population of the Agency for International Development for distribution to USAID missions that provide contraceptive supplies to family planning programs in developing countries.

CONTRACEPTIVE SHELF-LIFE AND EFFICACY TESTING

A product expiration date is sometimes required by regulatory bodies in various countries. Generally, this date indicates that the manufacturer of the product has determined the product's life based on an actual time study of the product stored from the date of manufacture to the indicated expiry date. In fact, the real useful life of the product may indeed be beyond the established expiry date. The following is a discussion of shelf-life and product efficacy of some AID-supplied contraceptive commodities:

1. Oral Contraceptives - The manufacturers of AID-supplied oral contraceptives have established a useful shelf-life for these products of 5 years. This shelf-life is based on a test of the actual life of the products stored in blister packs in temperate climatic conditions. No attempt has been made to establish a shelf-life of longer than 5 years. Therefore, it is not known what the maximum useful life of these products may be, but it is suspected that product efficacy may extend beyond the tested 5 year period. Numerous tests of AID-supplied oral contraceptives that have been stored in the high temperatures and humidity of the tropics for longer than 5 years further substantiate a potential shelf-life greater than 5 years.

   The first indication of product deterioration will likely be a reduction in the hardness of the pill. If the pills crush when pushed through the foil backing of the blister pack, the quality of the product is suspect. While this is not an absolute test of product integrity, it is one obvious and easy check that program managers can use to spot check stores inventories or supplies distributed to users. It should also be noted that the paperback foil pouch for the 100 cycle trays (shelf cartons) and the shipping cartons provide extra protection.

2. Condoms - Condoms stored in a temperate environment and protected from light, ozone, and chemical damage have a shelf-life in excess of 5 years. Higher temperatures and humidity associated with tropical climates will most likely shorten the useful life of this product. Hence, greater care should be taken in storing condoms in such environments. Specific "don'ts" include avoiding fluorescent lighting and not storing chemicals in the same facilities that condoms are being stores. With regard to this last point, chemical damage can occur from fumes or gases from stored petrol, halogen gases (such as freon), or various types of liquid solvents (WD-40, etc.).

3. IUDs - While the U.S. Food and Drug Administration does not require an expiration date on IUDs at this time, some manufacturer's may indicate

an expiration date on their products signaling that certain precautions should be taken. In particular, since IUDs are made from plastic material, they should be protected from heat or direct sunlight. Lippes Loop IUDs, procured under AID's current contract with Ortho Pharmaceutical Company, show a 5-year expiration date. These same IUDs carried a 3-year expiration date in 1982 and 1983. However, based on further studies, product shelf-life was increased to 5 years. The Copper-T IUD, currently being purchased from Finishing Enterprises, has an established shelf-life of 4 years. It is probable that this period will be extended, as well, as additional studies continue to show a longer useful life. As with oral contraceptives and Lippes Loops, the 4 years shelf life for Copper-T IUD's reflects the results of current suppliers' tests rather than maximum potential useful life of the product. Finally, program managers should not be alarmed by a darkening in the copper color in the Copper-T. This is a natural change caused by the interaction of the copper with chemicals used to sterilize the IUDs. Managers should know, however, that any break or perforation of the sterile wrapper makes the product unacceptable for use.

4. Spermicides - Neo-Sampoon has a shelf life of 5 years. Emko Foam has a shelf life of 3 years.

For all of these products, good management practices the maintenence of product integrity. For instance, stress damages most products, with condoms being particularly vulnerable.

Therefore, products should be stored in stacks no more than 8 feet high with room for air circulation around individual stacks. Adhering to sound First In, First Out (FIFO) procedures for issuance of product and to responsible management of inventories will assure that products are distributed within useful shelf-life periods.

If the shelf-life period has expired for commodities still in storage and the program manager suspects, either by inspection or user complaints, that a product is no longer effective, USAID should test samples of these products before further distribution to program outlets. Efficacy testing is done by the U.S. manufacturer of the product at no cost to AID. For a preliminary assessment of product quality, USAID should proceed as follows:

1. Collect random samples of the product lot in question; lot number and place of storage should be recorded at this time. The following minimum quantities of each product should be obtained: 500 condoms, 100 monthly cycles of orals, and 100 units of IUDs.

2. Samples, together with lot information, should be sent to the commodity and Program Support Division within the Office of Population in AID (S&T/POP/CPSD) to forward to the appropriate U.S. manufacturers. Exact address is:

   Agency of International Development
   S&T/POP/CPSD
   Room 720 - SA-18
   Department of State
   Washington, D.C. 20523

3. Any descriptive information about warehousing conditions should also be sent to help manufacturers understand some of the factors that may affect a product's efficacy. This is particularly relevant for condoms because they are susceptible to multiple sources of damage and are more effected by adverse storage conditions than are oral contraceptives and IUDs.

4. Await further distribution of product in question until response from S&T/POP/CPSD. Feedback from manufacturers may take up to 3 months from the time of receipt of product.

5. If testing results show the product to be useful, it should be distributed in a manner that ensures its most rapid use. If testing results show the product to be no longer useful, it should be destroyed immediately.

ATTACHMENT 3

Bangladesh Supervisory Checklist

CHECKLIST OF THANA VISIT

District:_____ Date Visited:_____ Thana:_____ Date Visited:_____

Persons Contacted 1._____ Title:_____
2._____ Title:_____
3._____ Title:_____
4._____ Title:_____

GENERAL INFORMATION

Population:_____ No. of Unions_____ Total Couples_____
Eligible/Fertile Couples_____ Acceptors_____ No. of Clinics_____

STAFFING PATTERN

	TPC&FPO	TTO	Thana Asst...	Clinic FWV's	Union FPA's	Ward FWA's	MCO's	Dai's
Sanctioned:	_____	___	_____	_____	_____	_____	_____	_____
On the Roll:	_____	___	_____	_____	_____	_____	_____	_____

MODE OF TRANSPORTATION

Distance from District HQ:_____ How accessible to the Thana HQ?_____
_____ If the principal mode of transportation is not year around, how to reach the Thana HQ during the remaining portion of the year?_____
_____
Comments (if any):_____
_____
_____
_____

DEPO ISSUES TO THE THANA

Month	OP-50(MC)	OP-80(MC)	Condom(DZ)	Foam(V)	RIV#	Date
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
Total:	_____	_____	_____	_____	_____	_____

Above issuances recorded in Thana ICC's: Yes___ No___. If Form 6 (ICC) not yet introduced, assist Thana Staff in establishing the cards. Comments (if any):____
_____
_____
_____

THANA ISSUES

Month	OP-50(MC)	OP-80(MC)	Condom(DZ)	Foam(V)
Total:				

Note: These figures are to be worked out from individual vouchers (form 2), and also to be cross checked with those reported in Thana Form 7 Reports (Col.. 5 & 12).

THANA PERFORMANCE

Month	Oral Pills(MC)	Condom(Doz)	Foam(V)	M.R.'s	IUD's	Vasectomy	Tubectomy

VERIFICATION OF STOCK AS OF

	OP-50(MC)	OP-80(MC)	Condom(DZ)	Foam(V)
Balance Per Thana ICC:				
Physical Count:				
Diff:Short/Over:				

Note: Where possible, assist Thana Staff in segregating & recording on ICC's any article lying in unusable condition (if not already done so). In doing this, SM Method is to be followed.

THANA SUPPLY POSITION

Article	Issued During Last 6 Months	Average Monthly Issue	Thana Stock As Of	Thana Months Supply
OP-50(MC)				
OP-80(MC)				
Condom(CZ)				
Foam(V)				

Comments (if any): _____

SM METHOD

Review the overall progress that the Thana has made in adopting the SM Method and assess the cause of deficiency, if any.

Form #	In Use Yes	In Use No	Date Since in Use	Reason for Deficiency (if any)
1	___	___	_____	_____
2	___	___	_____	_____
3	___	___	_____	_____
4	___	___	_____	_____
5	___	___	_____	_____
6	___	___	_____	_____
7	___	___	_____	_____

Comments (include measures necessary, as well as those suggested/taken by you to overcome the deficiencies): _____

_____

_____

_____

GENERAL COMMENTS (INCLUDING STORAGE CAPACITY, CONDITION/FACILITIES)

_____

_____

_____

_____

Signed: _____

_____

Name of Inspector

(For comments, use additional sheet if needed)

1/ In the case of District Storekeeper, mention date of assignment.

2/ SM Method is the method prescribed in the Supply Manual. Form numbers refer to the forms outlined in the Supply Manual.

ATTACHMENT 4

November 14, 1984

MEMORANDUM

TO : USAID Population/Health Officer
USAID Program Officer

FROM : S&T/POP/Commodity and Program Support Division (CPSD)*

SUBJECT : USER FRIENDLY GUIDE TO CONTRACEPTIVE PROCUREMENT

This objective of this "User Friendly" guide to contraceptive procurement is to aid you, at the least emotional cost possible, in assuring that your country receives the contraceptive products necessary to sustain an effective and efficient family planning program. From talking to many Mission people here in Washington, it seems that filling out the Contraceptive Procurement Tables, the first step toward achieving this objective, is less than a favorite activity at post. The result is often procrastination and/or improperly completing the Tables which, in turn, can lead to costly delays in your country receiving its contraceptive needs.

The following is a primer to the Contraceptive Procurement Table (CPT) Guidance you will be receiving shortly from ST/POP. This primer is intended to be more inspirational than instructive, and should not be used as a sole

basis for calculating your country's contraceptive requirements. Comprehensive instructions for that exercise are contained in the CPT Guidance, and related guidelines can be found in the other documents referenced at the end of this Memo. After reading this, however, we hope you will approach the upcoming CPT exercise more positively.

Attached to this Guide is an empty CPT. Once you have done a little homework, a CPT for each contraceptive product (yes, one CPT for each type of condom and pill), by program, can be completed in no time. Come up with numbers for the following four variables and you're well on your way:

1) Beginning-of-Year Stock Level
2) New Supply (received to date and scheduled)
3) Estimated Product Use
4) Desired End-of-Year Stock Level

* This Memo was prepared at the initiative of Corina Stover, an IDI who spent a few weeks in S&T/POP/CPSD as part of her AID/W training program. She and Karen Peake Tcheyan, a staff member of CPSD, wrote this document to help prepare you for the next round of Contraceptive Procurement Tables to be completed as part of the FY 1987 ABS exercise.

Materials Needed:

a) several sharpened pencils,
b) a hand calculator,
c) all correspondences between USAID and AID/W, especially PIO/Cs and product shipping schedules (see Annex C to CPT Package) containing USAID's contraceptive requests, by product and program, and desired dates of shipments,
d) a CPT and ACCOMPANYING INSTRUCTIONS AND ANNEXES

READY, BEGIN....

1. BEGINNING-OF-YEAR STOCK LEVEL

This is the sum total of all AID and other donor provided stocks of a specific contraceptive product in central, regional and district warehouses or any other point whose sole purpose is to receive and store commodities as of January 1 of the first calendar year (CY) shown on the CPT. In the next set of Tables to be sent to you shortly, the first CY on the CPT is 1985.

Ideally, a current inventory of stock should be kept in order to quantify the flow of contraceptives through the storage and delivery points of your country's distribution system. If you do not have an efficient system of quantifying this process SPEAK UP. There is technical assistance available to you to set up such an infrastructure through S&T/POP/CPSD's own staff or through its RSSA with the Centers for Disease Control (CDC). By merely guessing the beginning-of-year stock, you could potentially (a) underestimate the actual stock situation, create an overstocking by overordering based on this initial poor guess, and face potential product wastage, or (b) overestimate the actual stock situation, create an understocking by not ordering enough, again based on this initial bad guess, and experience an emergency shorfall at some later date.

In addition to depending on reliable stockkeeping records, physical inventories should be conducted on a periodic basis by counting all commodities to verify the balance on hand as entered in these records. Begin as early as possible in the beginning of the FY to survey outlets in order to have on hand that beginning-of-year stock quantity that you will need to properly fill in your CPT's due back to AID/W by March of that FY.

2. NEW SUPPLY

This is a summary of all AID and other donor shipments of a particular product for a particular country program received and/or scheduled to be received (i.e., already ordered) within a given CY. The best way to check what has been shipped and what is scheduled to be shipped by AID in a particular year is to create a file containing this information. Keep all PIO/C's, shipping schedules (Annex C's to CPT Guidance) and cables on contraceptives in one place. If you should misplace any documents, let S&T/POP/CPSD know as soon as possible and we will be glad to send a copy to you from our files. A similar file should keep track of contraceptive supplies provided by other donors.

3. ESTIMATED PRODUCT USE

Unlike the previous two variables, the numbers you enter for estimated product use are not expected to be exact; this variable is as stated, an estimate. Here you need to forecast the proportion of your country's target population that will be using the services of the AID-supported program(s) in question and convert these user statistics into contraceptive product needs. Among other things, this requires knowledge of other sources of contraceptive services within the country, including public and private programs, and the magnitude of their operations.

Converting numbers of users into numbers of pills, condoms, IUD's, and/or vaginal foaming tablets is a simple mathematical calculation once you have defined your target population and their specific contraceptive needs. For a very good explanation of estimating needs, see Chapter V, "Forecasting", Logistics Guidelines for Family Planning Programs prepared by CDC. For excerpted guidance, see the information contained in the forthcoming CPT Guidance Package.

4. DESIRED END-OF-YEAR STOCK LEVEL

In addition to ordering sufficient quantities of contraceptives to meet your country's estimated product use, you want to create a "reserve" in country equal to an appropriate percentage of variable #3 above. Among other considerations, this percentage should be determined by a program's storage capacity, the nature and extent of a program's contraceptive distribution network, and projections about a program's takeoff potential. Generally, we recommend a desired end-of-year stock level equal to 100% of a program's estimated needs in any subsequent year. However, for example, due to the number of layers in a program's destruction system or its anticipated growth, some programs may justify more than 100 percent to fill their supply lines. It will be up to you to evaluate your program's particular need.

So there you have it, the basics for properly completing the CPT's! Just keep in mind that the time required to secure contraceptives from S&T/POP/CPSD sometimes can slip through your fingers. Your CPT's must be completed in a timely manner in order for S&T/POP/CPSD to ensure procurement of commodities for your country's program(s). So much of the bother of filling out the CPTs can be minimized by just collecting, organizing and analyzing data relevant to program contraceptive needs as it is created.

Expect your "Guidance for Completing the FY 1987 Annual Budget Submission (ABS) Contraceptive Procurement Tables" within the next four weeks. It is due back to us completed by March 1985.

ATTACHMENT 5

Estimating Active Users from Logistics Data

This analysis is useful in determining the proportion of the target population, i.e., married women age 15-44, the family planning program is serving. The following steps will give us the numerator for this analysis. The denominator is generally obtained from census data.

Three steps are involved in estimating the number of active users (numerator) served by the program.

STEP 1: Determine the quantities dispensed to users by method, from program service statistics. If this information is unavailable, the quantities issued from warehouse(s) can be substituted, although the results will be less accurate.

This information is obtained from the second-to-last row of the Summary of Contraceptives Issued/Dispensed and Family Planning Users form.

STEP 2: Determine personal annual usage of the various contraceptive methods dispensed by the program.

Special studies can be conducted to determine usage rates, especially for coital-related methods. Usage rates of noncoital-related methods, such as orals and injections, are fixed: 13 cycles per year and 4 injections per year. In the absence of special studies, we recommend the following annual and quarterly usage rates, which are referred to as "Conversion Factors":

Method	Conversion Factors	
	Annual	Quarterly
Orals	13 cycles	3.25 cycles
Injections	4 injections	1.00 injection
Condoms	144 units	36.00 units
Foaming tablets	144 units	36.00 units
Cream, Jelly, Foam	6 tubes	1.50 tubes

For methods such as IUDs and diaphragms, we look at usage in terms of the average amount of time a woman will use these methods. This is approximately 2.5 years for IUDs, and 1 year for diaphragms.

STEP 3: Estimate number of active users served by the program during the quarter by method.

With the exception of IUDs and diaphragms, this is done by dividing the quantity of a specific method dispensed during the quarter by its corresponding Conversion Factor. For IUD's, we multiply 10 (2.5 years = 10 quarters), while for diaphragms we multiply by 4 (1 year = 4 quarters).

Example:

Method	Quantity Dispensed During Quarter	Conversion Factor	Estimated Active Users
Orals	13,069	3.25	4,021
Injections	814	1	814
Condoms	9,789	36	272
Foaming tablets	21,040	36	584
Cream, Jelly, Foam	543	1.50	362
IUDs	266	10	2,660
Diaphragms	20	4	80
		TOTAL	8,793

Thus, this example shows that 8,793 users were served during the quarter. Stated more precisely, 8,793 quarters of contraceptive use were achieved through program activities undertaken during the quarter.

This type of analysis can be done by clinic, be region, or for the entire program.

Finally, we mentioned earlier that the proportion of married women aged 15-44 served by the program can be determined from this analysis. Let us assume that census projections estimate that 458,000 married women age 15-44 years line in the State. In order to determine the proportion of this population that is served by the program, the following calculation is performed:

$$8,793 \div 458,000 = 0.019 = 1.9\%$$

LOGISTICS ANALYSIS TABLE
(in 000's)

FY 1987 ABS
Country: _____
Project No. _____
Program: _____
Product: _____
Source of data for Beginning-of-Year Stock: _____

	CALENDAR YEARS 1985	1986	1987	1988	1989
1. Beginning-of-Year Stock (PLEASE READ INSTRUCTIONS TO FILL IN THIS LINE ITEM)					
PLUS					
2. New Supply of Same Product					
(a) AID supplies received in 1984 to date					
(b) additional AID quantities scheduled for shipment but not yet received					
(c) other sources of supply of same product (host country/other donors)					
MINUS					
3. Estimated Product Use					
MINUS					
4. Desired End-of-Year Stock Level (equal to ___% of estimated use in subsequent year)					
EQUALS					
5. NET SUPPLY SITUATION/AID REQUIREMENT (negative number signifies additional supplies of product required from AID; positive number signifies no AID requirement and need to calculate line item #6. (1+2-3-4-5)					
6. Estimated End-of-Year Stock Level SEE INSTRUCTIONS FOR THIS LINE ITEM. (4+5-6)					

*U.S. GOVERNMENT PRINTING OFFICE: 1985-569-440 Region 4.